AKAI SERVICE MANUAL

M 8

SPECIFICATIONS

MODEL NUMBER: Akai Model M-8, portable 4-track stereo tape recorder.

WEIGHT (NET IN CARTON): 47.3 lbs. (21.5 kg.) for M-8
2.4 lbs. (1.1 kg.) for all accessories supplied.

DIMENSIONS : 20"H × 13"W × 9"D, overall, case closed. (510H × 340W × 226D in m/m)

POWER REQUIREMENTS: A.C. 100, 110, 120, 200, 220, or 240 volts interchangeable. 50-60 cycles.

POWER CONSUMPTION: 100 VA.

RECORDING SYSTEM: Specific "cross-field" recording based on the theory of trailless recording bias system. Inline 4 track stereo and 4-track monaural recording.

PLAYBACK SYSTEM: Inline 4-track stereo, monaural playback.

TAPE SPEED : Three speeds; 7½" (19 cm.), 3-¾" (9.5 cm.) and 1-⅞" (4.75 cm.) per second. (15" second with an accessory capstan and pinch wheel.)

TAPE SPEED DEVIATION: Less than ±3 per cent at all tape speeds.

WOW AND FLUTTER: Less than 0.15% at 7-½ ips. R.M.S.
Less than 0.25% at 3-¾ ips. R.M.S.
Less than 0.35% at 1-⅞ ips. R.M.S.

FAST FORWARD AND REWIND TIME: 90 seconds for 1,200 ft. tape at 50 cycles and 75 seconds at 60 cycles.

FREQUENCY RESPONSE: 30 to 25,000 cps. at 7-½ ips;
±3 db. 40 to 21,000 cps. at 7-½ ips;
±3 db. 40 to 18,000 cps. at 3-¾ ips;
±4 db. 40 to 10,000 cps. at 1-⅞ ips.

DISTORTION : Within 2% at 1,000 cps, OVU (total harmonic)

SIGNAL-TO-NOISE RATIO: 40 db below recorded level signal at all speeds.

CROSS TALK : Within 53 db between each track.

CHANNEL SEPARATION: Better than 80 db at 1,000 cps ± 3 VU.

POWER INPUT LEVELS: Microphone input level
-55 db (VR. max) at 1,000 cps.
Phono and radio input level
-15 db (VR. max) at 1,000 cps.

POWER OUTPUT: Head output, 1 mv. at 1,000 cps.
Pre-Amplifier output, 0.8 V at 1,000 cps, impedance 10,000 ohms
Main output, 34 dbm. up (in 600 ohms).

INSULATION RESISTANCE: More than 10 MEG ohms

INSULATION YIELD STRENGTH: More than one minute at A.C. 1,000 V with Headphone

MONITORING SYSTEM: With headphone (8 ohms) during recordin

MOTOR : Hysteresis synchronous, two-speed motor, dynamically balanced.
1/100 HP. Power ratio, 70 per cent.
3,000 to 1,500 r.p.m. at 50 cps,
3,600 to 1,800 r.p.m. at 60 cps.

HEADS : Inline four-track stereo/monaural record-play head;
Impedance...5,000 ohms at 1,000 cps.
Four-track, cross-field bias head;
Impedance...14,000 ohms at 60 kc.
Four-track erase head
Impedance...18,000 ohms at 60 kc.

MICROPHONE USED: Square-shaped, dynamic microphone
Impedance...50,000 ohms
Sensitivity...−55 db.
Frequency Response...70 to 15,000 cps ±10 db.

SPEAKER INCLUDED: Two 4-inch dynamic speakers for vertical stereo sound effect
Impedance...8 ohms
Allowable Input...6 watts
Frequency Response...80 to 12,000 cps, ±10 db.

TUBES USED : 6267 (EF86) × 2, 12AD7 (12AX7) × 2, 6BQ5 × 2, 6X4 × 2, 6AR5 × 1.

REELS USED : Up to 7" reel

RECORDING LEVEL INDICATOR: Horizontal, A-model VU meter

Ⅱ HOW TO MEASURE DESIGNATED VALUES IN SPECIFICATIONS

TAPE SPEED DEVIATION: Record the 1,000 cps. sine curve of the tape speed at rating speeds with a standard sound recorder (AMPEX 351A, for instance) which is little affected by the tape speed deviation throughout the whole length of the tape. Put this standard tape on the tape recorder under test for playing back, and measure its output by a counter, then convert the value into rating power frequency to evaluate the tape speed deviation.
For a rough measurement, the tape speed deviation can also be measured with a speed test timing tape by the count on a stop watch.

WOW AND FLUTTER: Playback the 3,000 cps. standard tape that guarantees wow and flutter within 0.07 per cent, and read the effective value on wow meter.
Since the sensibility of wow and flutter frequency below 2 cps. and above 5 cps. drops, the frequency over 5 cps. is put to 3 db/OCT circuit, and the frequency below 2 cps. is put to 6 db/OCT circuit for adjustment. This adjusted value is called auditory compensated value.

FREQUENCY RESPONSE (OVERALL FREQUENCY RESPONSE): Connect to the input terminal of the test recorder a sweep frequency of the level-20 db. Record the sweep signal, playback the tape, terminate the output with eight ohms.
Read the frequency response which should have a maximum deviation of 6 db.

TOTAL HARMONIC DISTORTION FACTOR: Provide the input terminal of the tested recorder with 1,000 cps. sine curve signals and record these signals on a recording tape at the zero level on the recorder's internal VU meter. Then playback the signals under the normal recording condition to measure the distortion factor by an oscillator. Remove the recording tape from the recorder, then read the noise level on the oscillator to get the required distortion factor by the following formula:

$d0 = d - d1 - d2$

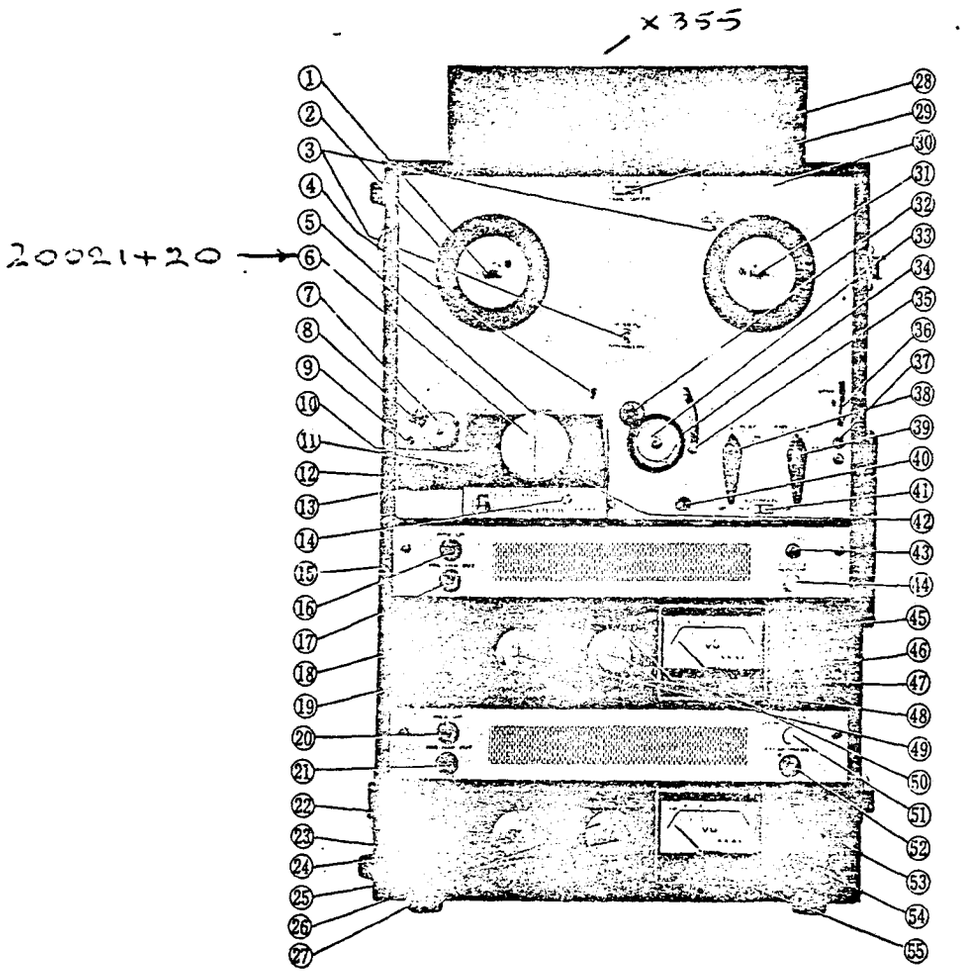
d0...required
d...overall distortion factor
d1...noise level
d2...distortion factor of the oscillator used

SIGNAL TO NOISE: Playback the sine curve, 250 cps. tape recorded on a standard recorder on the tested recorder to measure the voltage.
Remove the tape, then measure the noise level under the same condition. Calculate the ratio between the two in decibel.

OUTPUT: Playback on the test recorder the 1,000 cps. sine curve tape which was recorded at the zero VU level on a standard recorder. Terminate the test recorder with eight ohms.
Square the voltage reading, then divide the figure by eight ohms to get the r.m.s. power output.

CROSS TALK: Record 1,000 cps. signal at +3 VU on the third track, then playback this signal thru a 1,000 cps. Band Pass Filter.
Compare the output of tracks 1 and 3 in decibels.

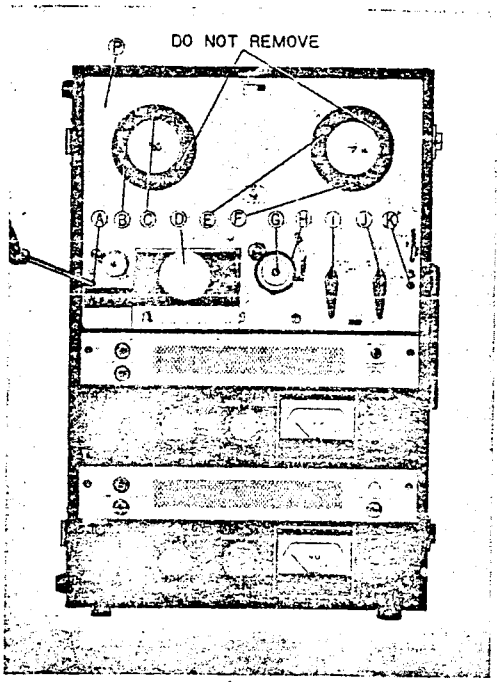
Ⅲ LOCATION OF CONTROLS



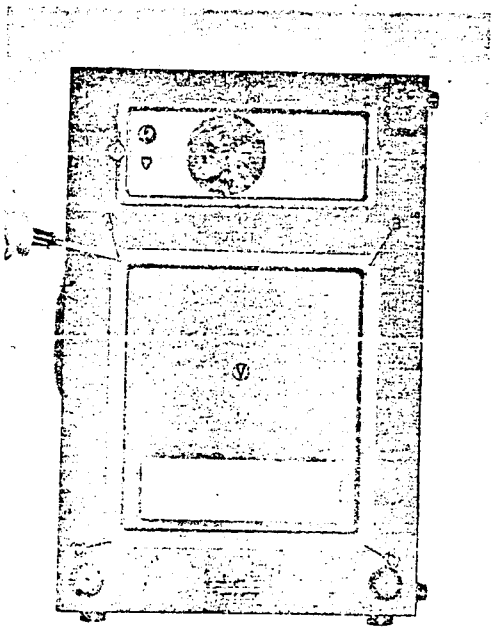
① FEED REEL SPINDLE
② GUARD CIRCLE
③ CYCLE CONVERSION SWITCH
④ CAPSTAN STORAGE POST
⑤ RETAINING SCREW
⑥ TRACK SELECTOR KNOB
⑦ TAPE GUIDE ROLLER
⑧ TAPE CLEANER
⑨ RELEASE BUTTON
⑩ HEAD COVER, MAIN
⑪ ERASE HEAD
⑫ INDEX (REVOLUTION) COUNTER
⑬ RESET BUTTON
⑭ CROSS-FIELD HEAD
⑮ DIN (ONE CONNECTION) JACK
⑯ PICK UP INPUT (LEFT CHANNEL)
⑰ PRE-AMP OUTPUT (LEFT)
⑱ LINE INPUT (LEFT)
⑲ MICROPHONE INPUT (LEFT)
⑳ PICK UP INPUT (RIGHT CHANNEL)
㉑ PRE-AMP OUTPUT (RIGHT)
㉒ LINE INPUT (RIGHT)
㉓ MICROPHONE INPUT (RIGHT)
㉔ VOLUME CONTROL (RIGHT)
㉕ EQUALIZER SWITCH (RIGHT)
㉖ TONE CONTROL (RIGHT)
㉗ CARRYING CASE
㉘ SOUND MIRROR
㉙ SPEED CHANGE & ON/OFF SWITCH
㉚ TOP (DECK) PANEL
㉛ TAKE-UP REEL SPINDLE
㉜ CAPSTAN SHAFT
㉝ PINCH ROLLER CAP
㉞ PINCH ROLLER
㉟ AUTOMATIC SHUT-OFF LEVER
㊱ INSTANT STOP LEVER
㊲ START BUTTON
㊳ RECORD, PLAY SWITCH
㊴ REWIND, FAST-FORWARD SWITCH
㊵ RECORD SAFETY BUTTON
㊶ AUTO STOP, SHUT-OFF SWITCH
㊷ RECORD/PLAY HEAD
㊸ PILOT LAMP (RECORDING INDICATOR)
㊹ INTERNAL SPEAKER ON/OFF SWITCH
㊺ POWER SWITCH
㊻ SPEAKER OUTPUT JACK (LEFT)
㊼ TONE CONTROL (LEFT)
㊽ EQUALIZER SWITCH (LEFT)
㊾ VOLUME CONTROL (LEFT)
㊿ VOLUME UNIT METER (LEFT)
(51) SOUND ON SOUND SWITCH
(52) STEREO HEADPHONE JACK
(53) FUNCTION SWITCH
(54) SPEAKER OUTPUT JACK (RIGHT)
(55) VOLUME UNIT METER (RIGHT)

Ⅳ DISASSEMBLY TO REMOVE TAPE TRANSPORT UNIT & AMPLIFIERS

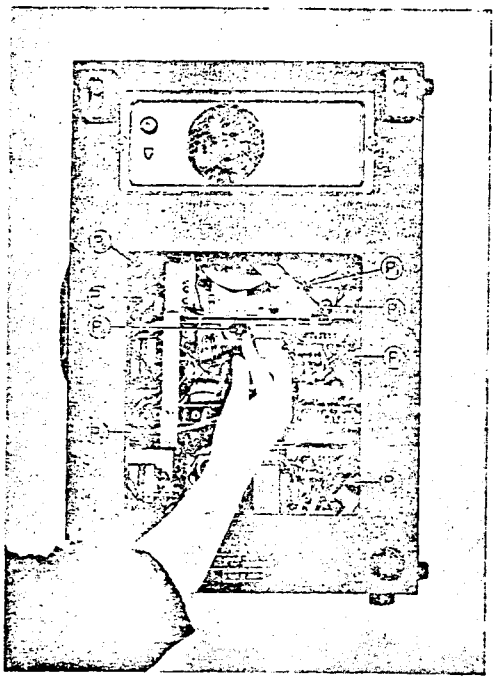
(1) Loosen the *RETAINING SCREW* (G) of *PINCH ROLLER* (H) using a Phillips-headed screw driver to remove the *PINCH ROLLER* (H) by hand.
Remove *HEAD WHEEL* (D) and *DECK CONTROL KNOBS* (I) & (J) by loosening their retaining screws. Also take off all of the screws identified from (A) to (K) to remove *DECK PANEL* (P).



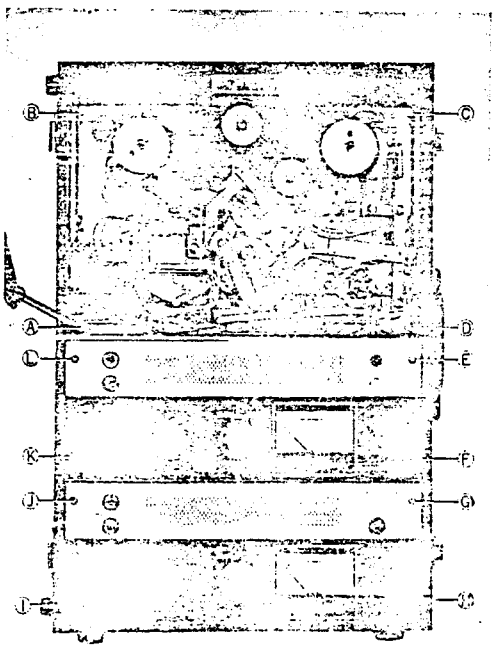
(2) Loosen the screws marked from (A) to (D) in order to remove *VENTILATOR* (V).



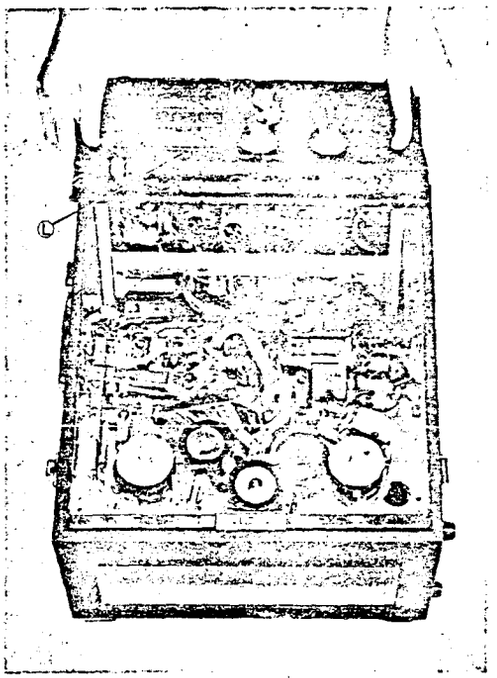
(3) Disconnect all of the *PLUGS* marked (P1), (P2), (P3), (P4), (P6), (P7), (P8) and (P10) by hand.



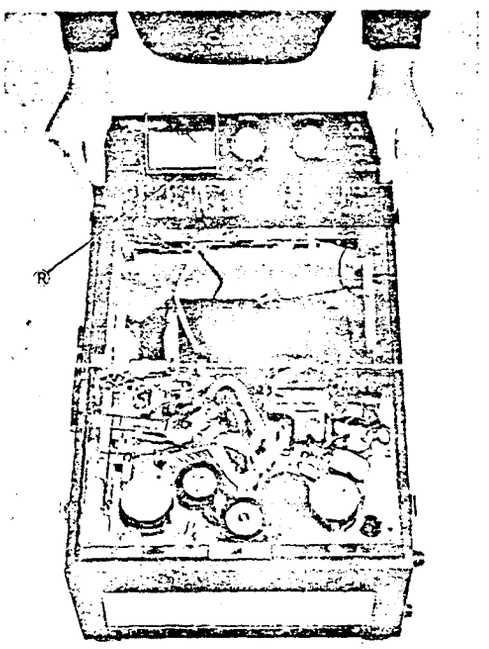
(4) Loosen all of the screws marked from (A) to (L).



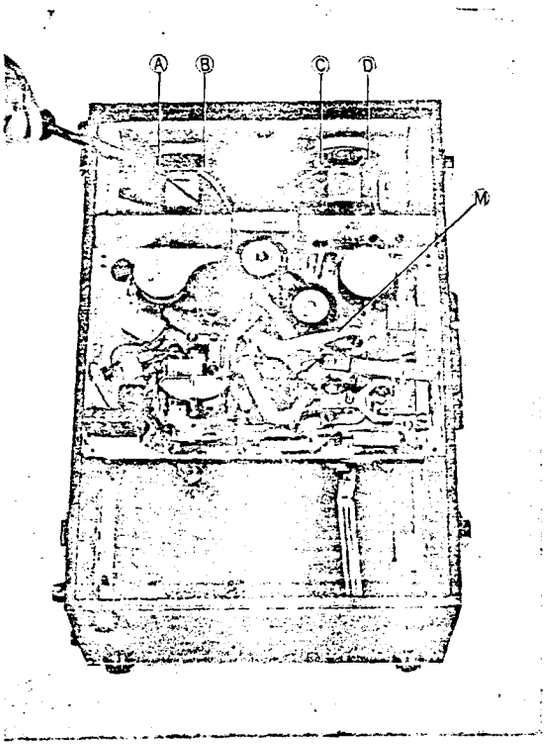
(5) Lift the *LEFT AMPLIFIER* (L) from the carrying case.



(6) Lift the *RIGHT AMPLIFIER* (R) from the carrying case.



(7) Use a soldering iron to disconnect soldered ends of speaker cables and remove these cables. Now remove *TAPE DECK* (M) from the case.



V TRANSPORT MECHANISM

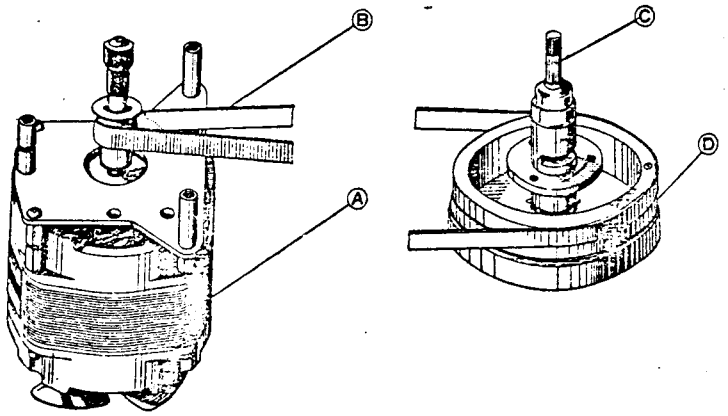


Fig. 1

Driving of Capstan

Figure 1.

(A) Motor
(B) Driving Belt (flat belt)
(C) Capstan
(D) Flywheel

High-speed rotation of *Motor* (A) is reduced by *Driving Belt* (B) and transmitted to Capstan (C), which is connected to Flywheel with ample inertia and enables rating rotation by absorbing minor rotation distortion of motor itself. (See Fig. 1)

Capstan Rotation	606 r.p.m. at 7-½" (19 m.) per sec.
	303 r.p.m. at 3-¾" (9.5 cm) per sec.
	151.5 r.p.m. at 1-⅞" (4.75 cm.) per sec.
Motor Rotation	3,000 to 1,500 r.p.m. at 50 cps.
	3,000 to 1,800 r.p.m. at 60 cps.

Driving of Pinch Roller

Put tape between rotating capstan and pinch roller and push pinch roller against capstan, this will transport the tape at rated speed. The appropriate pressure of pinch roller at this time is between 1,000 to 1,150 grams at the tape speed of 7-½" (19 cm.) per second.

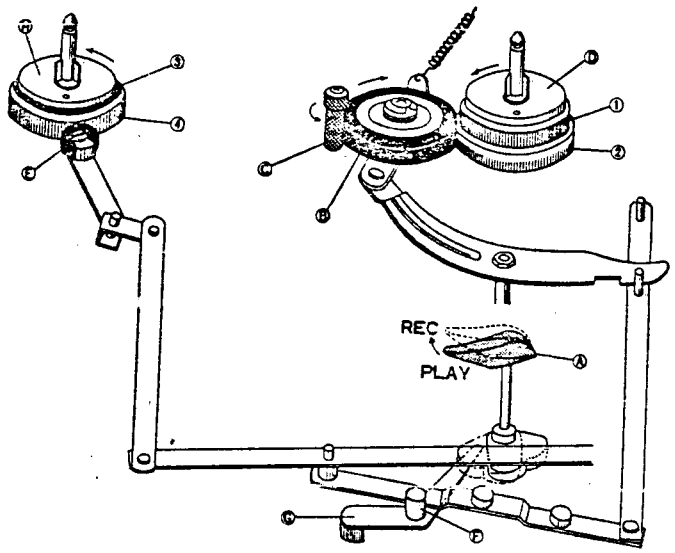


Fig. 2

Recording and Play Back

Turn the *RECORD, PLAYBACK* knob (A) to "PLAY" position, and pinch roller presses hard against capstan to move tape at the rated speed. At the same time, *Idler* (B) moves between *Motor Bushing* (C) and the *Take-Up Reel Spindle* (D) to transmit *the motor rotation* to (D) so that the tape is moved and wound on the take-up reel.

The Take-Up Reel Spindle Base is made up of two plastic rollers (1 and 2) with a clutch felt in between. The Idler is rotating *the plastic roller* (2) below. Therefore, the tape-winding friction is adjusted by the slipping of the felt to enable rated winding of the tape.

On the other hand, *the Supply Reel Spindle* (H) has *a Brake, roller* (E) hung on the Plastic Roller (4) below which provides appropriate back tension by the clutch felt slipping to the rotation of the Pulley (3) above.

To prevent accidental erasure, *the Record Interlock Button* (F) must be depressed before the RECORD, PLAYBACK knob can be moved to the "REC" position. The *Safety device* (G) is depressed to enter the record mode.

(See Figures 2 and 3)

Braked Rotation Slipping Rotation

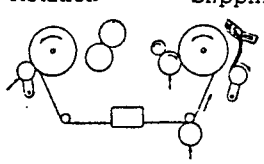


Fig. 3

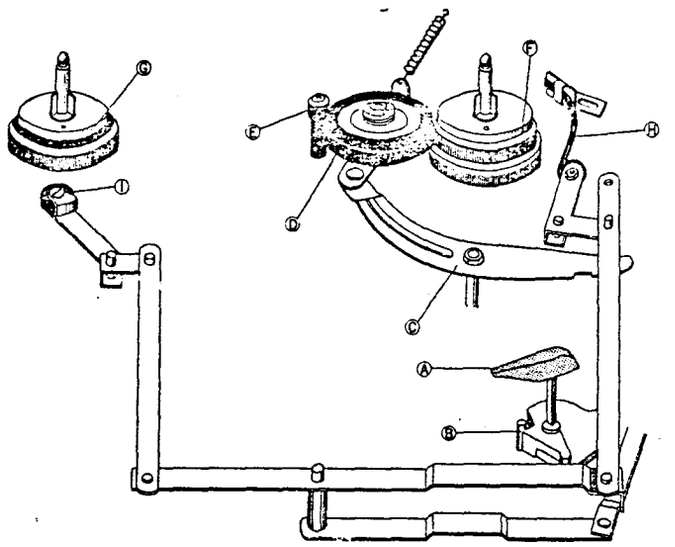


Fig. 4

FAST-FORWARD MECHANISM

Turn *the FAST FWD-REWIND knob* (A) to "FAST FWD" position, and *the cam* (B) under the knob pushes up *the Lever* (C). *The Idler* (D) moves into the space between *the Plastic Roller* (F) above the Take-Up Reel Spindle and the upper part of the rotating motor drive bushing to transmit the motor rotation to the take-up reel spindle. At the same time, *the Brake Band* (H) and *Brake Roller* (I) come off the reel spindle to free *the Supply Reel Spindle* (G), thereby allowing fast winding of the tape onto the take-up reel.

(See Figures 4 and 5)

Free Rotation High-Speed Rotation

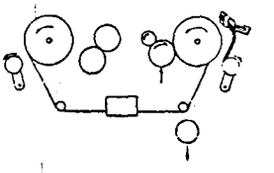


Fig. 5

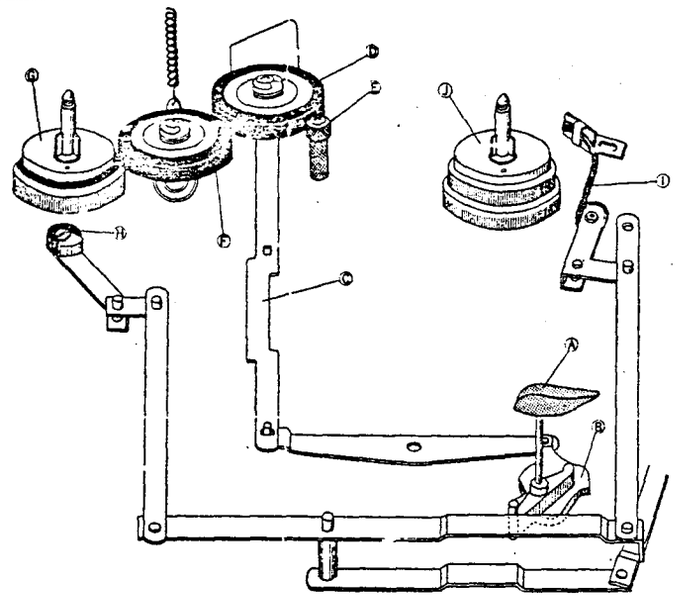


Fig. 6

REWIND MECHANISM

Turn *the FAST FWD-REWIND knob* (A) to "REWIND" position, and *the cam* (B) under the knob pushes *the Lever* (C) up. *The Idler* (D) moves into the space between the upper part of the rotating *Motor drive bushing* (E) and *the Intermediate Pulley* (F) to transmit the high-speed rotation of the motor through the intermediate pulley to *the Supply Reel Spindle* (G). At the same time, *Brake roller* (H) and *Brake Band* (I) come off the reel spindle to free *the take-up reel spindle* (J), thereby rewinding the tape into the supply reel at a fast speed.

(See Figures 6 and 7)

High-Speed Rotation Free Rotation

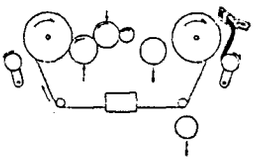


Fig. 7

Modes of Operation	Pinch Roller	Take-up Idler Wheel	Rewind Idler Wheel	Take-up-side Brake	Supply side Brake
(a) STOP	×	×	×	○	○
(b) FAST-FORWARD	×	○	×	×	×
(c) REWIND	×	×	○	×	○
(d) RECORDING PLAYBACK	○	○	×	×	×

NOTES: ×-marks indicates "open" and
○-marks "engaged"

STOP CONTROL

Push the stop lever to "STOP" position, *Brake Roller* (A), and *Brake Band* (B) depress reel spindles to stop rotation of the reel spindles.

As brake rubber depresses the plastic rollers under the reel spindles, no friction works on the tape itself.

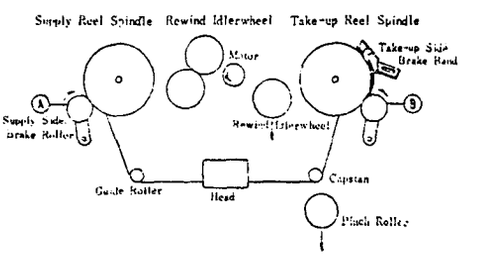


Fig. 8

AUTOMATIC STOP MECHANISM

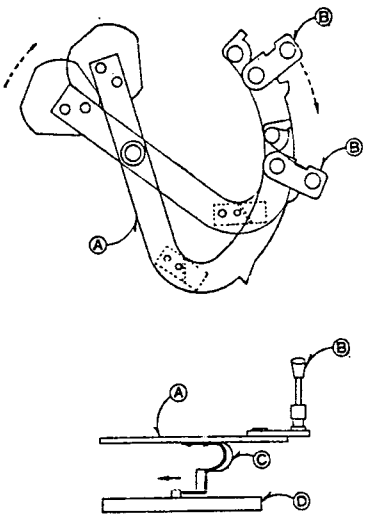


Fig. 9

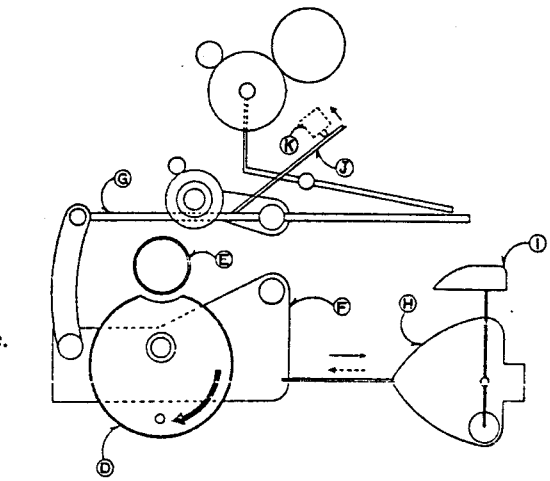
When the tape is *threaded on the pin* (B) at the top of the *Automatic Stop Lever* (A) comes off the pin, the Automatic Stop lever returns to the original position by the action of springs. At this time, *the panel spring* (C) below the Automatic Stop lever slightly pushes down the projected part of *the eccentric gear* (D), which gears into *the Flyweel Gear* (E) to start rotating and pushing up the *Momentary Stop Lever* (G) that is connected with *the eccentric gear base* (F).

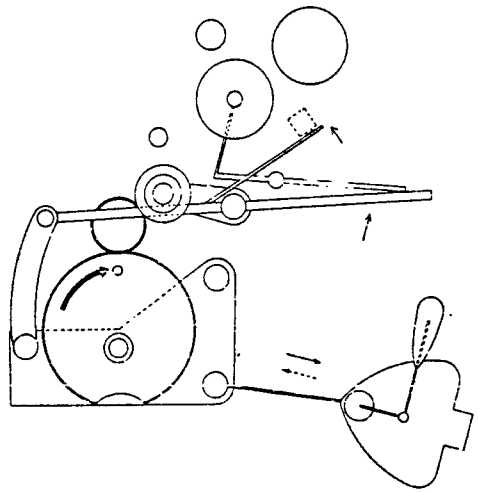
Thus, the eccentric gear maintains the mechanism in the state of tentative stop for "Playback" or "Recording".

For "Fast-forward", or "Rewind", *the Corkscrew lever* (H) works to push back the "FAST FWD, REWIND" knob to the "Stop" position before stopping itself.

When the Automatic Cut-Off Switch is moved to "CUT OFF" position, *the Shut-Off lever* (J) moves to the arrow-mark direction to cut the power circuit, thereby depressing the attached *Micro Switch* (K) to shut off the current.

(See a, b, c and d in Fig. 9)





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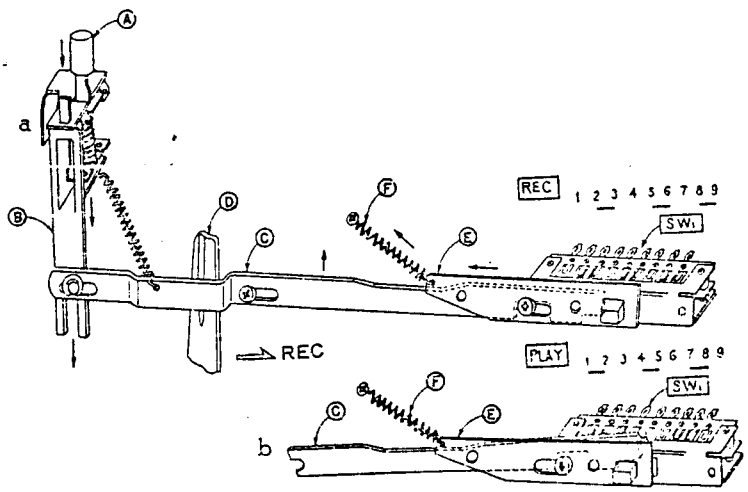
SOUND ON SOUND MECHANISM



By pushing *SOUND-ON-SOUND BUTTON* (A) while the recorder is set to recording condition, *LEVER* (D) is depressed and *LEVER* (C) is lifted through *LEVER* (B). Refer to Fig. 10-a.

As a result, *LEVER* (C) is released from stopper of SW-1 and SW-1 is reset to play condition as *LEVER* (E) is pulled by *SPRING* (F). Refer to Fig. 10-b.

In this condition, SOUND-ON-SOUND device is operative. If, however, SOUND-ON-SOUND is not operative, check all of the foregoing LEVERS to see that SW-1 is set to play condition.

Fig. 10

VI ADJUSTMENT OF TAPE TRANSPORT UNIT

1. ADJUSTMENT OF PINCH WHEEL

It is important that the pinch wheel shaft be kept in complete alignment with the capstan shaft. A proper pinch wheel pressure is between 1,000 and 1,150 grams when the unit is operated at the tape speed of 7-1/2 ips. Any deviation from this specification will result in wow and flutter. Check pinch wheel pressure using a spring scale and, if necessary, adjust the pinch wheel load spring to suit.

2. ADJUSTMENT OF TAKE-UP IDLER WHEEL

The take-up idler wheel must be kept in complete alignment with the take-up reel shaft. When the unit is set in fast forward condition, the idler wheel will contact to the upper knurled wheel of the take-up reel shaft assembly, and it will contact to the lower knurled wheel during record or play mode. Adjust idler wheel load spring so that the idler wheel pressure is kept between 50 and 80 grams. The idler wheel wears rapidly if the pressure is excessive, and slippage occurs in case the pressure is smaller than the specification.

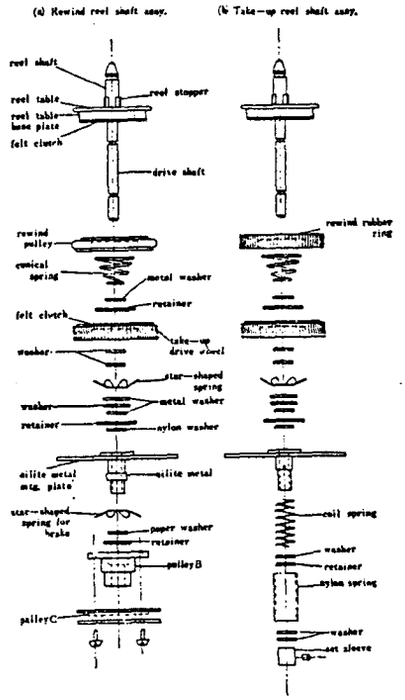


Fig. 11

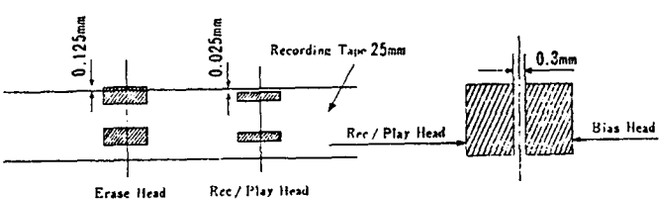


Fig. 12

3. ADJUSTMENT OF REWIND IDLER WHEEL

The rewind idler wheel must be kept in complete alignment with the rewind reel shaft. The amount of pressure to the knurled motor bushing should be maintained about 50 grams during rewind operation. Adjust both the idler load spring and rewind roller.

4. ADJUSTMENT OF INTERMEDIATE WHEEL

The intermediate wheel is located between the rewind idler wheel and the rubber ring which is used on the upper part of the supply reel shaft assembly. When the unit is set in rewind mode, it will contact to these parts simultaneously delivering torque of motor. An adequate pressure to be kept is 50 grams. Adjust the load spring of the intermediate wheel in case the pressure is not sufficient.

5. ADJUSTMENT OF TAKE-UP REEL SHAFT ASSEMBLY

A felt clutch material is attached to the bottom side of the reel table base plate so that recording tape will not be stretched during fast forwarding operation due to excessive tension. To check the amount of friction of this part, place onto the take-up reel table a 5-inch reel with recording tape wound by 60 m/m in diameter, and gently pull the end of tape upward using a spring scale. Adjust the conical spring so that the amount of tension at this part will be kept between 400 to 500 grams. Another felt clutch material is attached to the take-up drive wheel. It is used to provide proper slipping operation during record or play mode. The procedure for checking friction of this part is same as the foregoing, and between 120 and 200 grams of friction will provide the best result. Adjust the star-shaped spring immediate below the take-up drive wheel. When the unit is set in rewind mode, the amount of friction of this part will greatly be reduced and will become 10 to 20 grams. Check to see if this is satisfactory and, if not, readjust the star-shaped spring for Brake, and spring retainer washes accordingly. (See figure 11 (a) at left)

6. ADJUSTMENT OF SUPPLY REEL SHAFT ASSEMBLY

A felt clutch material is used between the lower side of the reel table base plate and the rewind rubber ring to protect recording tape from an excessive tension while rewinding operation. To check the amount of friction of this part, place onto the supply reel table a 5-inch reel with recording tape wound by 60 m/m in diameter and gently pull the end of tape upward using a spring scale. Adjust the conical spring so that the amount of tension be kept between 400 an 500 grams. Another felt clutch is attached to the rewind drive wheel and is used to provide proper slipping operation during record or play mode. The procedure for checking friction of this part is same as the foregoing, and between 80 and 120 grams of friction will give the best result. When the unit is set in fast forward mode, the amount of friction will greatly be reduced and will become 10 to 20 grams.

Check to see if this is proper and, if not, readjust coil spring and spring retainer washer to suit.

7. ADJUSTMENT OF TAPE HEAD

(See figure 12 (b) at left)

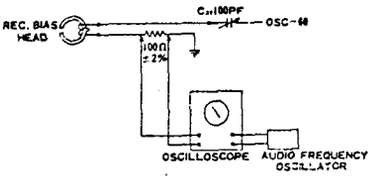
A vertical azimuth alignment of tape head is the only adjustment that can be made at the field of service. To align tape head, play 8,000 cycles recorded on an Ampex standard alignment tape. Rotate the azimuth alignment screw until a maximum playback level through the small hole which is positioned on the shield cover of the tape head assembly.

Ⅶ ADJUSTMENT OF AMPLIFIER

1. ADJUSTMENT OF RECORDING BIAS FREQUENCY

Recording/erasing bias frequency has been set at 60 KC plus or minus 5 KC before shipment. It is decided by inductance of the oscillator coil (part # OSC 60) and its resonant capacitor (part # C-22). To measure recording bias frequency, insert a 10 or 100 ohm resistor in series to the record/play head and connect vertical input terminals of an oscilloscope as shown in the Fig. 13. Another testing instrument to be prepared is an audio frequency oscillator and its output should be connected to horizontal input terminals of the oscilloscope. Vary frequency being generated by the audio frequency oscillator around 60 KC, and set the oscillator at the point where a lissajous figure appears on the oscilloscope. The recording bias frequency now corresponds to the reading of the oscillator. Check oscillator coil, C-22, C-27 and bias head if recording bias frequency measured is not within 60 KC plus or minus 5 KC.

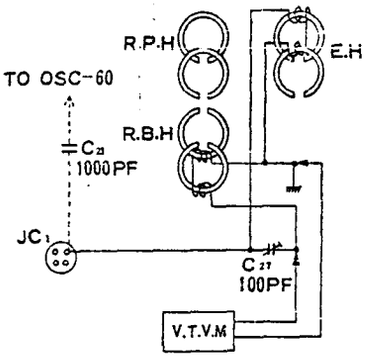
Fig. 13



2. ADJUSTMENT OF RECORDING BIAS VOLTAGE

A proper recording bias voltage differs on each head from 130 to 230 volts A. C., and it is stamped on the mounting bracket of tape head assembly. To measure recording bias voltage, connect a V. T. V. M. (Vacuum Tube Volt Meter) to the record/play head as shown in the Fig. 14. Check C-21, C-27 and bias head if recording bias voltage does not meet to the above-mentioned specification after adjusting C-27, a 100 pf variable capacitor.

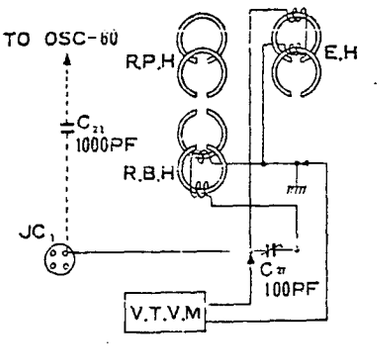
Fig. 14



3. ADJUSTMENT OF ERASING BIAS VOLTAGE

A proper erasing bias voltage is decided automatically as recording bias voltage is set. The erasing bias voltage, however, should always be more than 170 volts A.C. To measure erasing bias voltage, connect a V. T. V. M. to the erase head as shown in the Fig. 15. Check C-21 (1000 pf mica capacitor) and erase head if erasing bias voltage measured is lower than 170 volts A.C.

Fig. 15



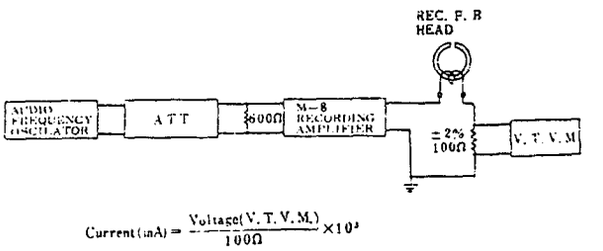
4. ADJUSTMENT OF RECORDING LEVEL

A basic recording level, usually referred to as "O VU", a set at the point where current of 30 μA ±10% flows to the recording head at 1000 cycles. The VU meter indicates 0 VU ±2 VU when a signal of 55 db ±5 db at the microphone jack or −15 db ±5 db at the line input jack a given with the volume control set at its maximum.

Adjustment of recording level can be accomplished by varying sensitivity of VU meter, however, it is not necessary to make in a field of service as all VU meters have correctly been calibrated at factory before shipment. See Fig. 16 for details.

NOTE: Make sure to stop oscillation by disconnecting the oscillator coil # OSC 60 at the points marked "P" and "G" prior to measurement of recording level.

Fig. 16



$$\text{Current (mA)} = \frac{\text{Voltage(V. T. V. M.)}}{100\Omega} \times 10^3$$

VIII MAINTENANCE PROCEDURES

1. LUBRICATION INSTRUCTION

For maximum service life and optimum performance, lubricate the parts identified below after each 500 hours of operation. Use only light machine oil of good quality

Motor	3 drops
Drive Capstan Shaft	2 drops
Rewind Idler Wheel Bearing and Wind take-up Idler Bearing.	1 drop
Intermediate Idler Bearing	1 drop
Pinch Wheel Bearing	2 drops
Take-up and Supply Reel Shaft Bearing &	2 drops

Also apply a liberal film of light machine grease to each roller surface of all levers and cams.

CAUTION: DO NOT OVER-LUBRICATE, AND WIPE OFF EXCESS IMMEDIATELY USING A COTTON SWAB SOAKED IN ALCOHOL. OTHERWISE, THE OVER-FLOWED LUBRICANT MAY BE SCATTERED DURING OPERATION AND DETERIORATION OF RUBBER COMPONENT PARTS WILL RESULT.

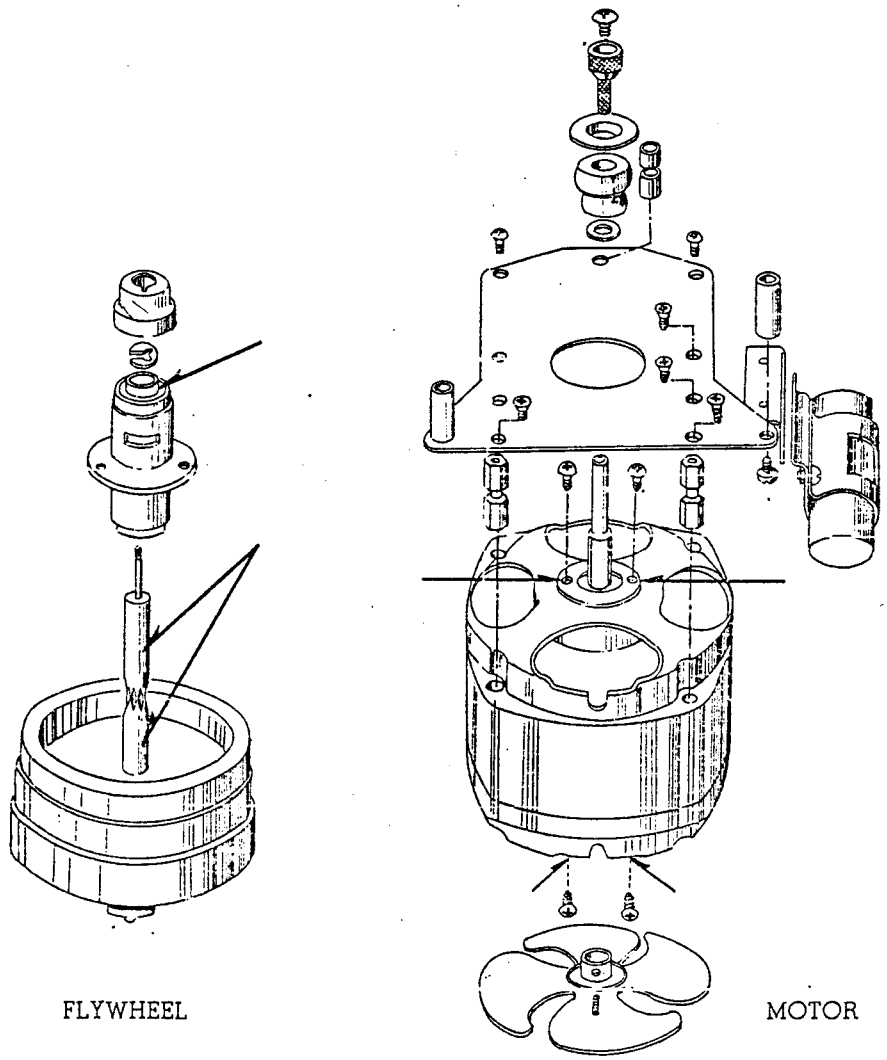


Fig. 17

2. CLEANING TAPE HEADS AND OTHER PARTS

Wipe surface of tape heads, guide roller bearing, capstan bushing and pinch wheel periodically with a soft cloth soaked in alcohol or carbon-tet.

IX LIST OF REPLACEMENT PARTS

Parts No.	Nomenclature
	TOP PANEL
81-001	Deck Panel 20021025
002	Guard Circle, Metal 0563
003	Konb, Track Selector Control 1027
004	Head Cover, Main 1022
005	Head Cover, Sub 1029
006	Name Plate 1030
007	Screw, Retaining Sub Head Cover 1031
008	Base, Head Cover 1032
009	Tape Guide, complete 1033
009a	Top Plate, Tape Guide 0566
009b	Table, Tape Guide 0567
009c	Bearing, Tape Guide 0568
009d	Bottom Plate, Tape Guide 0577
009e	Small Table, Tape Guide 0562
010	Tape Cleaner, Complete 0534
010a	Screw 040
010b	Felt 041
010c	Lever, Tension 042
010d	Spring, Tension Lever 043
011	Prop A, Head Cover 044
012	Prop B, Head Cover 045
013	Prop C, Head Cover 046
014a	Screw, Retaining Track Selector Control Knob 0557
014b	+Screw Flat Mould 3×12 0542
014c	+Screw Truss 3×4 0544
014d	+Screw Flat Mould 3×8 0550
014e	Mounting screw 0557
014f	3 mm Nut 0552
014g	4 mm Nut 0576
	Deck retaining Screws 20020670
	DECK FRAME
82-001	Deck Frame 20021054
002	Head Assembly, Complete 055
002a	Erase Head 056
002b	Record/Playback Head 057
002c	Bias Head (Cross Field Head) 058
002d	Field base 059
002e	Spring, C 0634
002f	Prop, Head 061
002g	Screw, Without Head 3×17 062
002h	Cover, Rotary shield 063
003	Index Counter, Complete 064
003a	Pulley, Counter 065
003b	Belt, Counter 066
003c	+Screw Semi-Cubic 3×5 067
004	Supply Reel Assembly 067
004a	Plate, Reel Table 0573
004b	Reel Shaft, Supply Reel 0574
004c	Rubber Ring 0580
004d	Rewind Pulley 0581
004e	Spring G, Left 1094
004f	Washer 0583
004g	Washer Pin, Large 0584
004h	Felt Washer 076
004i	Take-up Roller 0585
004j	Holder, Reel (Star type spring) 072

Parts No.	Nomenclature
82-004k	Nylon Washer 20021094
004l	Washer 080
004m	Washer 081
004n	Nylon Washer, Small 082
004o	Metal B, Reel Table 0590
004p	Washer Pin 084
004q	Pulley, B 085
004r	Pulley, C 086
004s	+Screw Semi-Cubic 3×6
004t	Screw, Without Head 4×7
004u	+Screw Flat 3×6 0577
005	Take-up Reel Assembly 091
005a	Reel Shaft, Take-up Reel 091
005b	Felt Washer 092
005c	Take-up Roller, A 0586
005d	Spring G, Right 094
005e	Deer Skin 095
005f	Take-up Roller, B 096
005g	Holder, Reel (Star type spring) 072
005h	Metal A, Reel Table 098
005i	Spring, F2 099
005j	Washer 20021100
005k	Nylon Spring 101
005l	Nylon Washer 102
005m	Set Sleeve 103
005n	Screw, Without Head 3×3 104
006a	AS Lever, Complete 20021080
006b	Spring, AS Lever 106
006c	Plate, AS Lever 107
006d	Spring 0634
006e	Plate, Gear 109
006f	Screw, Gear 110
006g	Eccentric gear 111
006h	Gear, Stopper 0647
006i	Spring, Stopper 0664
006j	Lever, Automatic switch 114
006k	Screw, Gear Plate 115
007	Instant Stop Lever, Complete 116
007a	Instant Stop Lever 117
007b	Spring, Instant Stop Lever 0662
007c	Holding, Instant Stop Lever 0663
007d	Holder, Instant Stop Lever 120
007e	Lever, Shut-off 121
008a	Recording Safety Button 122
008b	Cam Stopper 123
008c	Fiber, Cam Stopper 124
008d	Insulator Plate, Cam Stopper 125
008e	+Screw 4×5 126
009a	Pinch Wheel 20020611
009b	Metal Cap, Pinch Wheel 128
009c	Lever, Pinch Wheel 0674
009d	Shaft, Cam Roller 130
009e	Cam Roller, 13 mm 131
009f	Shaft, Pinch Wheel Lever 132
010	Take-up Brake Band, Complete 133
010a	Lever, Take-up Brake Band 134

Parts No.	Nomenclature
82-010b	Take-up Brake Band 135
010c	Holder, Take-up Brake Band 136
010d	Shaft, Take-up Brake Band Lever 20021137
011	Supply Brake Roller, Complete 20021132
011a	Lever, Supply Brake Roller 138
011b	Supply Brake Roller 20021082
011c	Screw, Brake Roller 141
012a	Switch, Automatic Shut-off 142
012b	Plate, Automatic Shut-off Switch 143
012c	Safety Lever A 20021144
012d	Safety Lever B 145
012e	Shaft, Safety Lever 146
013a	Switch, Speed Change (8 P Slide Switch) 147
013b	Plate, Speed Change Switch 148
014a	Idler Wheel B 20021149
014b	Bearing (635-ZZ) 20022598
014c	Cover, Bearing 150
014d	+Screw Truss 3×6 151
015	Idler Wheel A 20020647
016	Internal Wheel 20020552
017a	Lever, A 20021555
017b	Shaft, Lever A 0156
018	Lever, B 157
019	Lever, C 158
020a	Lever, G 159
020b	Metal, Lever G 160
021	Lever, K 161
022	Field Lever, A 162
023	Field Lever, B 163
024	Field Lever, D 164
025a	Field Lever, E 165
025b	Screw, Field Lever E 166
026	Lever, FA 167
027	Lever, FB 168
028	Lever, A2 169
029	Prop A, Panel 170
030	Spring Pin, B 171
031	Hum Bucking Coil 172
032	Switch, Cycle Change (N35-122) 173
033	Spring Holder 174
034	Cam Roller, A 175
035	Cam Roller, B 176
036	Washer Pin, Small 177
037	Stopper, Lever G 178
038	Micro Switch (V-1A) 179
039a	Lever, Belt Change 180
039b	Metal, Belt Change 181
039c	Spring Belt Change 182
040a	Prop, Panel Support 183
040b	Nut 184
040c	+Screw 4×12 185
041a	Torsion Spring 186
041b	Spring, Lever B 187
041c	Spring, Idler 188
041d	Spring, Pinch Wheel 189
041e	Spring, B 190
041f	Spring, D 191

3" Capstan 20021031

M3 Case 20021233

Parts No.	Nomenclature	
82-041g	Spring, D (New type)	192
041h	Spring, E	193
042a	+Screw Truss 4×8	20021179
042b	+Screw Semi-Cubic 4×10	195
042c	+Screw Semi-Cubic 4×8	20021196
042d	+Screw Semi-Cubic 4×6	197
042e	+Screw Flat 3×6	198
042f	+Screw Semi-Cubic 3×6	20021
042g	+Screw Semi-Cubic 3×5	200
042h	+Screw Semi-Cubic 3×18	201
042i	Screw A	202
043a	4 mm Nut	203
043b	3 mm Nut	204
044a	4 mm Ground Lug	205
044b	3 mm Ground Lug	206
045a	Lock Washer 4 mm	207
045b	Lock Washer 3 mm	208
046a	Washer	20021209
046b	Nylon Washer	210
047	Button, Start	211
048	Lug Plate, 3 P	212

DRIVE MOTOR

83-001	Motor, Complete	20021214
001a	+Screw Semi-Cubic 3×15	1214
001b	Stepped Pulley	20021215
001c	Belt Holder	1216
001d	Motor Pulley	1217
001e	Oil Retainer	218
001f	Motor Holder	219
001g	Rotar	220
001h	Cover, Motor	
001i	Stator	222
001j	Cover, Motor	223
001k	+Screw Flat Mould 4×30	0713
001l	Motor Fan	20021225
001m	Condenser 2.2 μF+0.6 μF	226
001n	Holder, Motor Condenser	227
001o	Hexagonal Nut, 20 mm	228
001p	Prop, Motor 22.5 mm	229
001q	Prop, Motor 21.5 mm	230
001r	Plate, Motor Condenser	231
001s	Supporter, Cord	232
001t	+Screw Semi-Cubic 4×24	233
001u	+Screw Semi-Cubic 4×10	0737
001v	+Screw Flat 4×10	235
001w	+Screw Flat 3×5	236
001x	Washer	20021237

20021087.

FLYWHEEL ASSEMBLY

84-001	Flywheel, Complete	232
001a	Capstan	239
001b	Main Metal Cap, B	240
001c	Washer Pin	20021705
001d	Main Metal Case	242
001e	Flywheel	243
001f	4 mm Ball Bearing	244
001g	Plate, Flywheel	245
001h	Washer, 6.5 mm	246

Parts No.	Nomenclature	
001i	Washer, 6mm	20021247
001j	Wing Nut	1249
001k	Screw, Flywheel Adjust	250
001l	5 mm Nut	251
001m	Prop A, Flywheel	252
001n	Prop B, Flywheel	253
001o	4 mm Spring Washer	254
001p	Drive Belt	255
001q	+Screw Flat 4×10	

SWITCH BLOCK

85-001	Switch Block, Complete	20021257
001a	Knob, Record/Play & Rewind Fast Forward	258
001b	Cam A	20021260
001c	Cam B	261
001d	Cam Roller, 12 mm	262
001e	Switch Table A	263
001f	Lever, I	264
001g	Fast/Forward Rewind Shaft	265
001h	Rotary Switch (V-123)	266
001i	Resistor ¼ W 500Ω	267
001j	Pin	20021268
001k	Plate, Cam	269
001l	Spring, K	270
001m	Cam C	271
001n	Switch Table B	272
001o	Prop, Receptacle	273
001p	UZ Receptacle	274
001q	Cam Amp. Switch	275
001r	Prop, Switch	276
001s	Switch Lever, A	277
001t	Switch Lever, B1	278
001u	Switch Lever, C	279
001v	Switch Lever, B2	280
001w	Ball Bearing, 8 mm	281
001x	Screw, Without Head 4×5	282

CASE

86-001	Carrying Case	20021283
001a	Handle	284
001b	Catch	285
001c	Speaker	286
001d	4 P Plug	287
001e	Nut	288
001f	Hinge	289
001g	Reel Holder, A	290
001h	Metal Foot	291
001i	Catch, Compartment Cover	292
001j	5 P Escutcheon	293
001K	5 P Receptacle	294
001l	+Screw Truss 3×20	295
001m	Rubber Foot (large)	296
001n	Rubber Foot (small)	297
001o	Ventilator Panel	298
001p	Ventilator Panel	299
001q	Fuse, 2A	300
001r	Fuse Holder	301

AMPLIFIER

Parts No.	Nomenclature	
8-AL101	Amp. panel, Left	20021302
AR101	Amp. panel, Right	20021303
AL102	Ventilator base, Left	304
AR102	Ventilator base, Right	305
A103	Amp. chassis	306
A104	Amp. chassis, A	307
A105	Amp. chassis, B	308
A106	Hum balancer mount	309
A107	4 P jack mount	310
8-AK2	C. R. compound body (100 KΩ 50 PF)	311
AK3	C. R. compound body (300 KΩ 50 PF)	312
AK4	C. R. compound body (20 KΩ 500 PF)	313
8-C1	Mica condenser 250PF 1 KV	314
C2	Tubular type electrolytic condenser 25 μf 25 WV	315
C3	Tubular type electrolytic condenser 1 μf 150 WV	316
C4	Condenser, enclosed in AK2 50 PF	317
C5	Tubular type paper condenser 0.01 μf 400 WV	318
C6	Tubular type paper condenser 0.02 μf 400 WV	319
C7	Tubular type electrolytic condenser 20 μf 300 WV	320
C8	Tubular type paper condenser 0.02 μf 400 WV	
C9	Tubular type paper condenser 0.02 μf 400 WV	
C10	Tubular type electrolytic condenser 25 μf 25 WV	323
C11	Tubular type paper condenser 0.01 μf 400 WV	
C12	Tubular type electrolytic condenser 25 μf 25 WV	325
C13	Tubular type paper condenser 0.01 μf 400 WV	
C14	Mica condenser 50 PF 1 KV	327
C15	Mica condenser 1000 PF 1KV	328
C16	Tubular type electrolytic condenser 25 μf 25 WV	
C17	Tubular type electrolytic condenser 20 μf 300 WV	330
C18	Tubular type paper condenser 0.001 μf 400 WV	331
C19	Tubular type paper condenser 0.01 μf 400 WV	
C20	Mica condenser 50 PF 1 KV	333
C21	Mica condenser 1000 PF 1 KV	20021334
C22	Tubular type electrolytic condenser 3 μf 350 WV	335
C23	Tubular type paper condenser 0.005 μf 400 WV	336
C24	FM condenser 430PF 1 KV	337
C25, C26	Lug terminal type Electrolytic condenser 20+20 μf 350 WV	338

Capstan drive shaft 20021256

M6.7.3 Spring 20021324

" Nylon Washer 20021372

AMPLIFIER

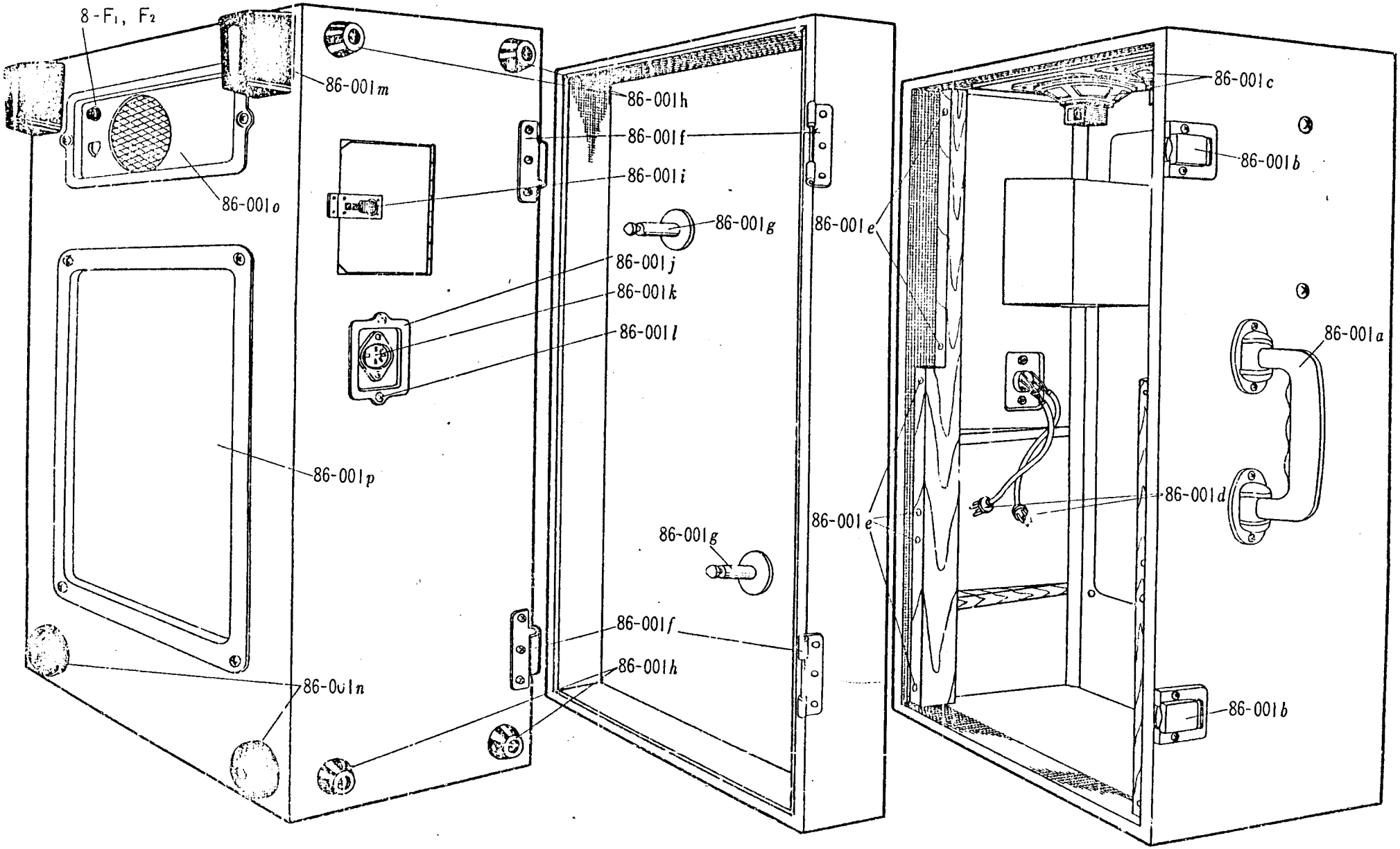
Parts No.	Nomenclature		
C27	Condenser, enclosed in AK4 500 PF		20021340
C28	Patting condenser 100 PF 1 KV		341
C29	Oil condenser 0.5 μf 350 WV		342
C30a C30b	M. P. condenser 2.2+0.6 μf 300 WV		
C31	Mylar condenser 0.002 μf 400 WV		344
C32	Tubular type paper condenser 0.05 μf 400 WV		345
8-F1	Fuse Post		20021346
F2	Fuse		347
8-J1	2 P Jack A		348
J2	2 P Jack A		349
J3	2 P Jack B		350
J4	2 P Jack A		351
J5	2 P Jack D		352
J6	4 P Jack		353
J7	1 P Jack		354
J8	5 P Jack (DIN Jack)		355
J9	4 P Jack		
J10	UZ Receptacle		357
J11	5 P Connector Jack		358
J12	1 P Jack		359
J13	3 P Jack		360
J14	4 P Jack		361
J15	AC Consent		362
J16	4 P Jack		
8-L1	Output transformer (5 K : 8Ω)		20021364
L2	Oscillator coil (OSC-60-450)		20020832
L3	Choke coil (6H-60 mA)		20021366
8-M1	M 9 VU meter		20021367
8-NL1	Neon tube bracket neon		20021368
8-P1	4 P Plug	369	
P2	UZ Plug	370	
P3	1 P Plug	371	
P4	4 P Plug	372	
P5	AC Plug	373	
P6	AC Plug	374	
P7	4 P Plug		
P8	4 P Plug		
P9	5 P Connector plug		20021377
P10	1 P Plug		
8-PL1	Pilot lamp (meter lamp)		20020824
8-R1	P-type fixed resistor 1/4 P	100 KΩ	20020844
R2	P-type fixed resistor 1/4 P	1 KΩ	20021320
R3	L-type fixed resistor ALW	1 MΩ	381
R4	L-type fixed resistor ALY	10 KΩ	382
R5	P-type fixed resistor 1/4 P	500 KΩ	383
R6	L-type fixed resistor ALW	100 KΩ	384
R7	L-type fixed resistor CLY	250 KΩ	385
R8	Resistor, enclosed in AK2	100 KΩ	386
R9	L-type fixed resistor CLY	1 MΩ	387
R10	L-type fixed resistor ALW	100 KΩ	388
R11	L-type fixed resistor ALW	500 KΩ	389
R12	L-type fixed resistor ALW	3 KΩ	390
R13	L-type fixed resistor CLY	250 KΩ	391
R14	L-type fixed resistor ALY	2 KΩ	
R15	L-type fixed resistor ALY	50 KΩ	393
R16	L-type fixed resistor ALW	3 KΩ	394
R17	L-type fixed resistor CLY	250 KΩ	
R18	L-type fixed resistor ALW	500 KΩ	397
R19	L-type fixed resistor ALW	2 MΩ	398
R20	L-type fixed resistor ALW	500 KΩ	400
R21	L-type fixed resistor CLY	150 Ω	401
R22	L-type fixed resistor CLY	5 KΩ	402
R23	Resistor, enclosed in AK3	300 KΩ	402
R24	L-type fixed resistor ALW	1 MΩ	403

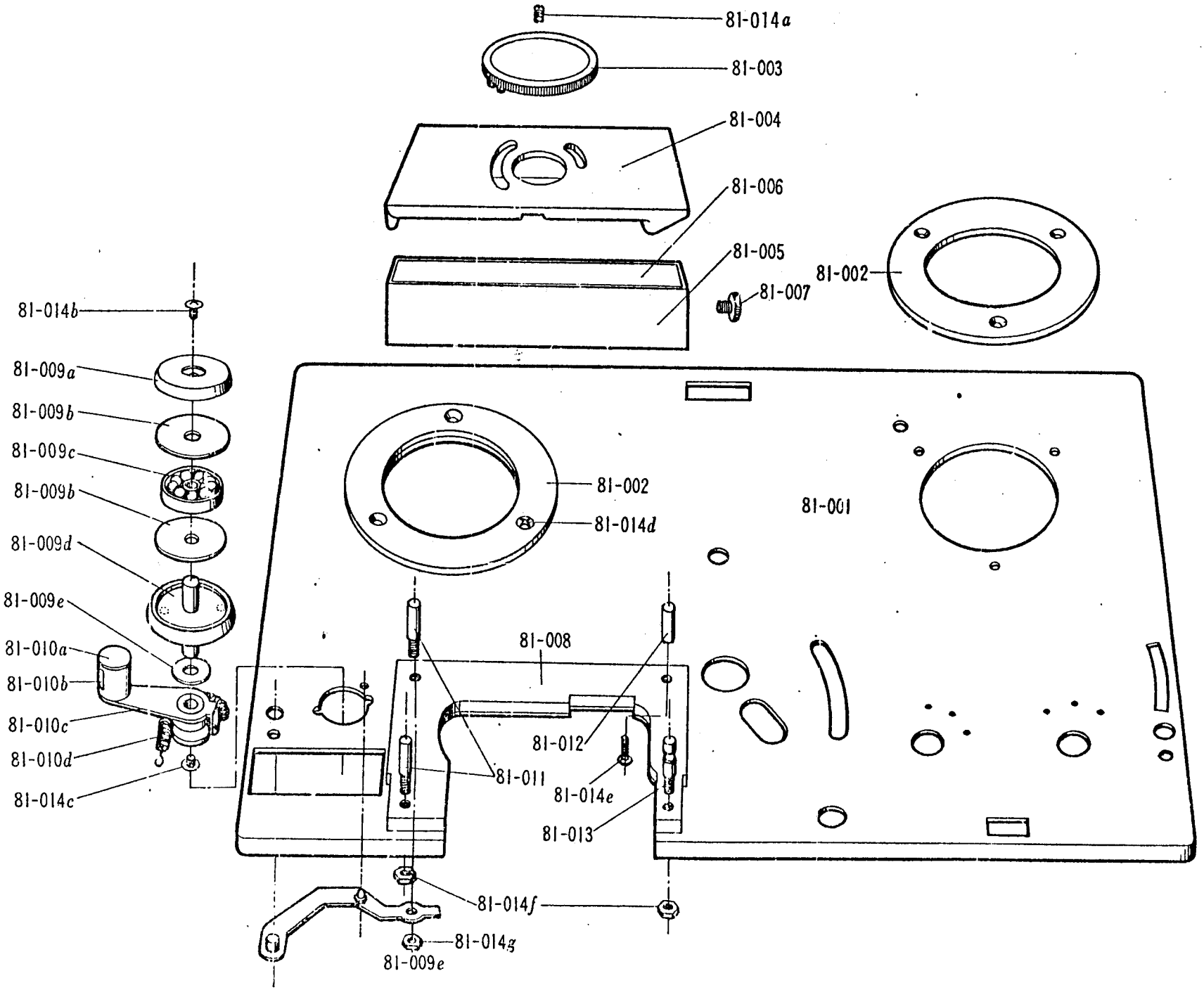
Parts No.	Nomenclature		
R25	L-type fixed resistor ALW	5 KΩ	20021404
R26	Flexible fixed resistor 1 W	8 Ω	405
R27	L-type fixed resistor ALW	300 KΩ	406
R28	L-type fixed resistor ALW	5 KΩ	407
R29	L-type fixed resistor ALW	100 KΩ	408
R30	P-type fixed resistor 1/4 P	20 KΩ	409
R31	Flexible fixed resistor 1 W	8 Ω	410
R32	L-type fixed resistor ALW	100 Ω	411
R33	L-type fixed resistor ALW	30 Ω	412
R34	L-type fixed resistor ALW	500 Ω	413
R35	P-type fixed resistor 1/4 P	10 KΩ	414
8-SW1	Slide switch SL 62M		415
SW2	Toggle switch F-103A		416
SW3	Rotary switch attached to VR1		417
SW4	Rotary switch 1-2-3 switch		418
SW5	Toggle switch F-103A		419
SW6	Rotary switch head change-over switch		420
SW7	Rotary switch c/s change-over		421
SW8	Micro switch		422
SW9	8 P Slide switch for motor speed change		423
SW10	Micro switch, automatic shut-off, for power source		424
SW11	6 P Slide switch, automatic shut-off, for power source		
SW12	Push switch, speaker on/off		
8-T1	Power transformer		20020392
8-TB1	40 P lug plate		
TB2	3 P lug plate		
8-V1	Vacuum tube 6267		20020904
V2	Vacuum tube 12AD7		20020905
V3	Vacuum tube 6BQ5		20020921
V4	Vacuum tube 6AR8		20020922
V5	Vacuum tube 6X4		20020923
8-VS1	Vacuum tube socket, 9 P mould type with sheath		
VS2	Vacuum tube socket, 9 P mould type with sheath		
VS3	Vacuum tube socket, 9 P mould type		
VS4	Vacuum tube socket, 7 P mould type		
VS5	Vacuum tube socket, 7 P mould type		
8-Z101	Amplifier knob A Equalizer		20021442
Z102	Amplifier knob B Tone		[illegible]
Z103	Amplifier knob C Volume		[illegible]
Z104	Shield plate amplifier shield parts		20021445
Z105	Shield plate output shield plate		446
Z106	Rubber cap shield rubber V1 cap		447
Z107	Clamp for 7 P		448
Z108	Clamp for 9 P		449
Z109	Amplifier lever set screw		450
Z110	Support AC receptacle support		451
Z111	Spring, left amplifier, attached to amplifier lever		452
Z112	+Screw flat mould 4×6		453
Z113	Amplifier lever, left		454
Z114	Cord clamp C		455
Z115	3 mm nut		456
Z116	Mounting post, 4 P jack		457
Z117	Screw, without head 4×6.5		458
Z118	Screw, without head 4×8.5		459
Z119	Screw, without head 4×10.7		460
Z123	Push button		461
Z124	S. O. S Push switch button		462
Z125	S. O. S Push switch		463
Z126	S. O. S Push switch lever		464
Z127	S. O. S Sub-amplifier lever		465
Z128	Amplifier lever, right		466
Z129	Spring, C		467
Z130	Spring, R		468
1/2 track head			20020520

Vol Cont LER 20020877

M3 Case lid 20021432.

X EXPLODED VIEW OF COMPONENT PARTS

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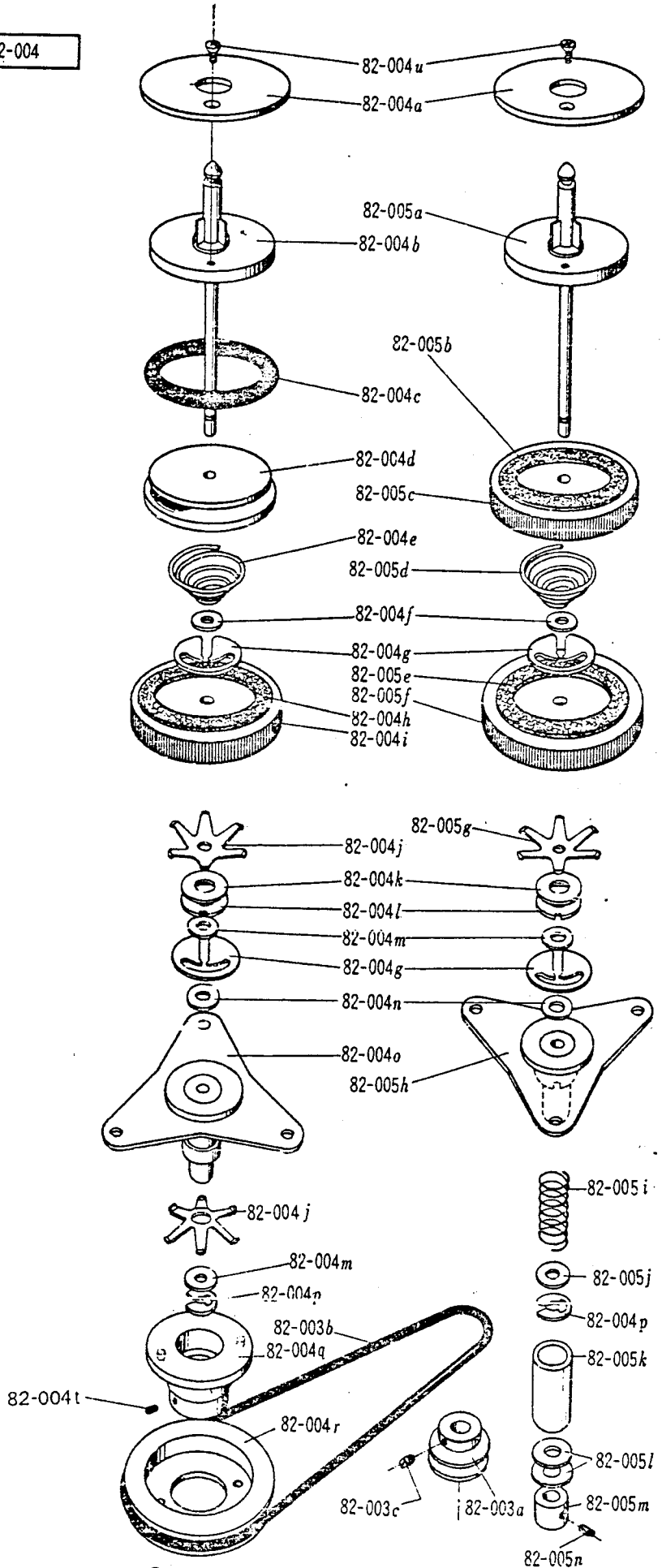
82-004

82-005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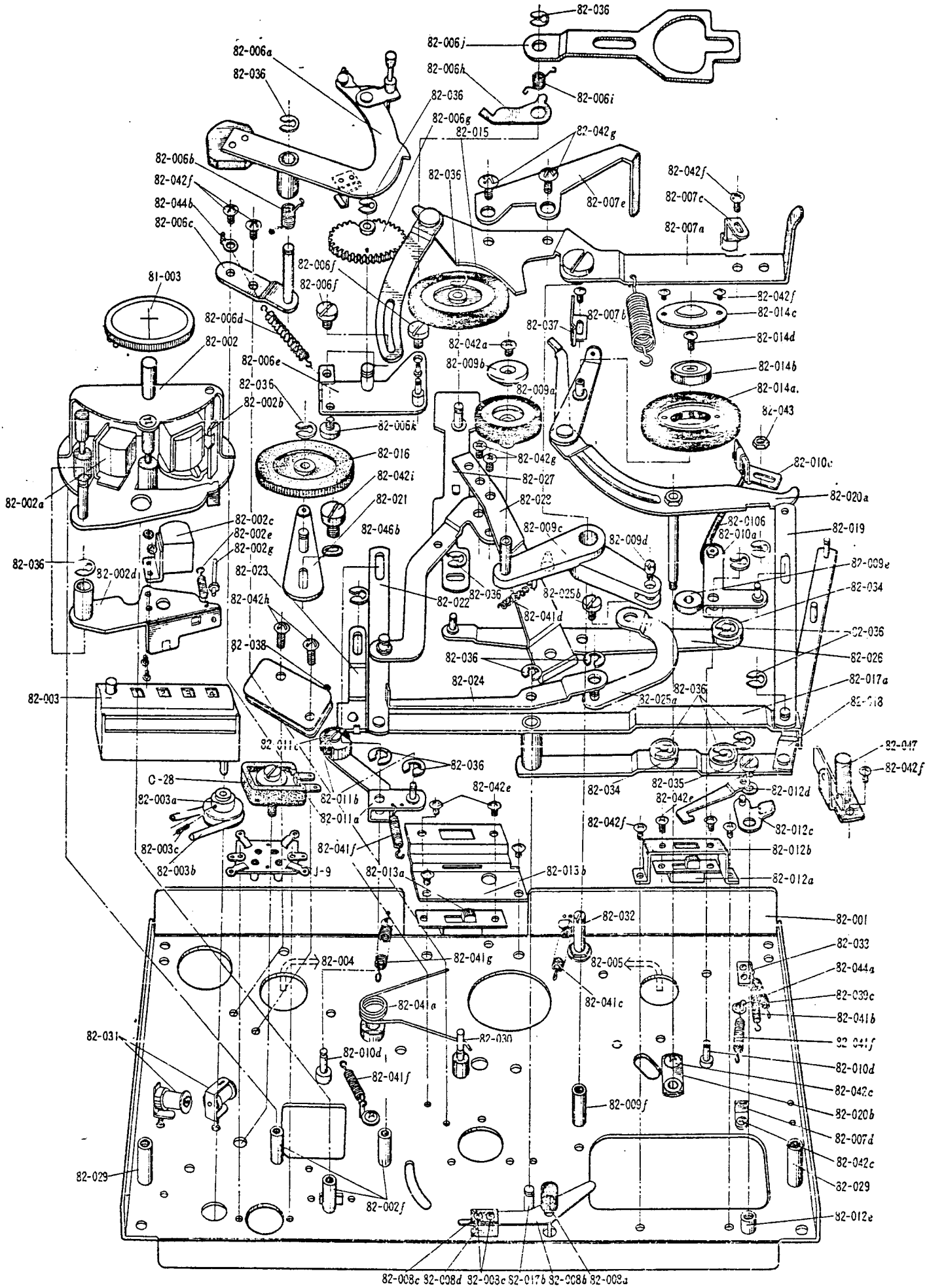
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82-036
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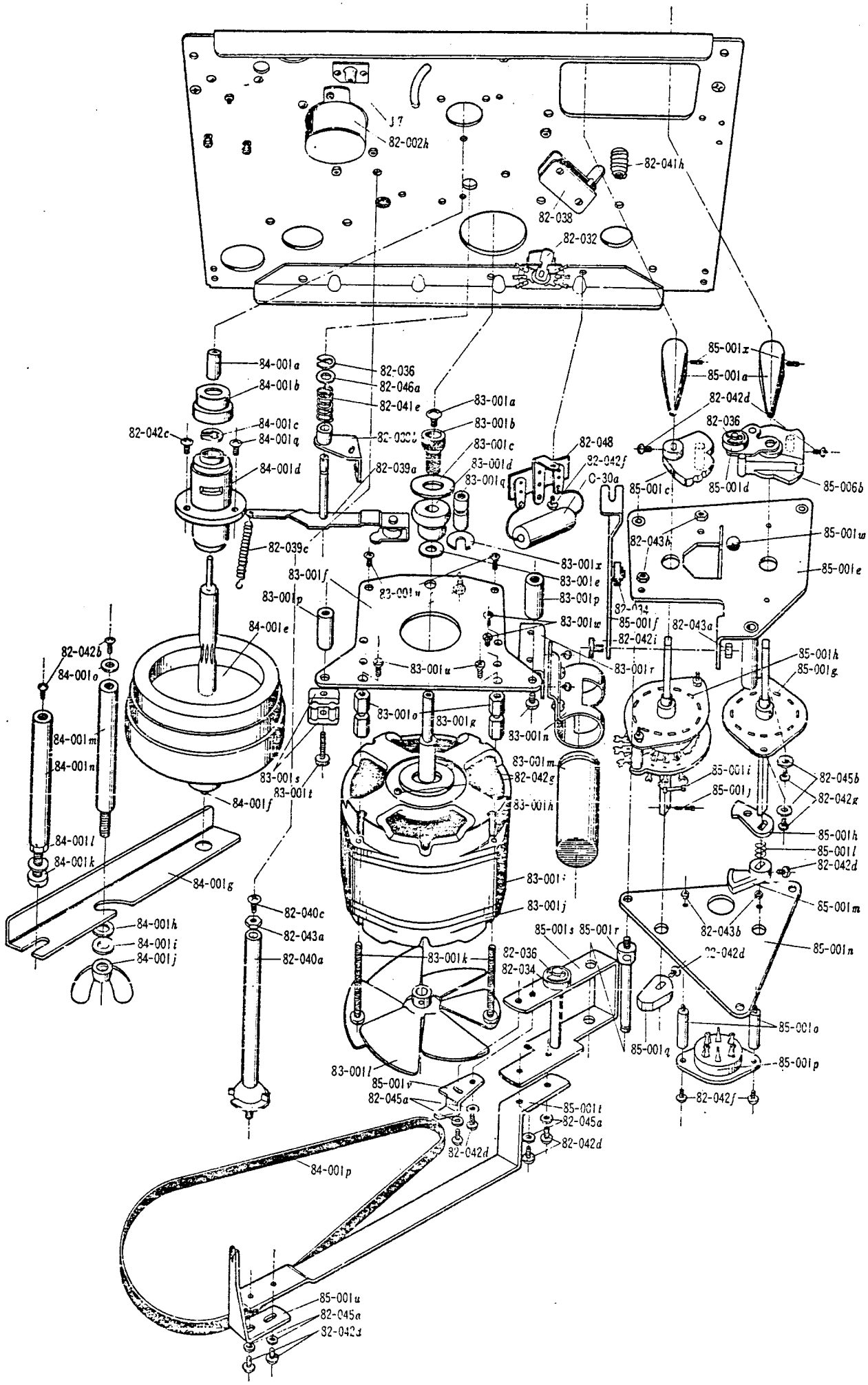
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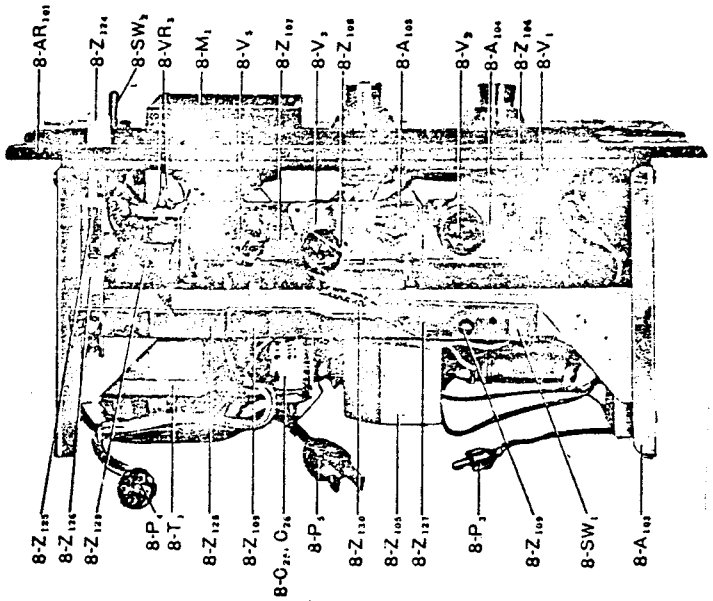
82-042d

Right
Amplifier

I



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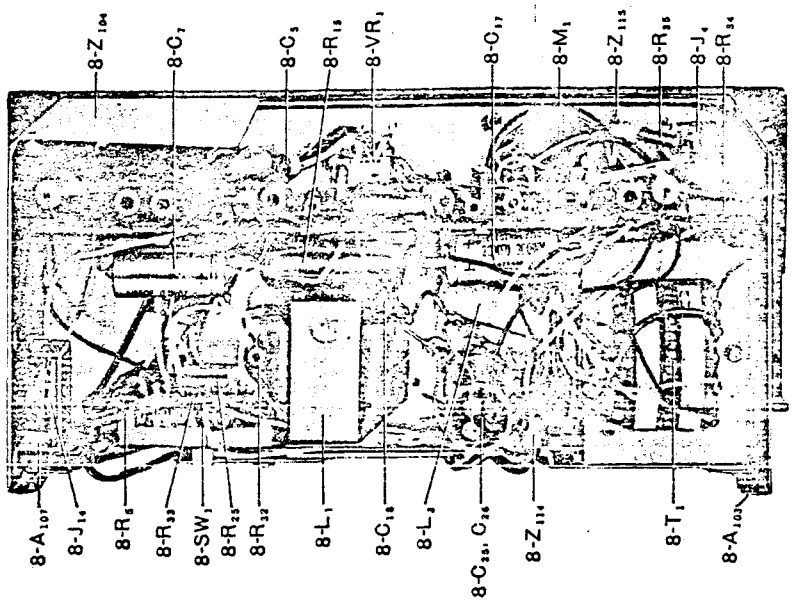

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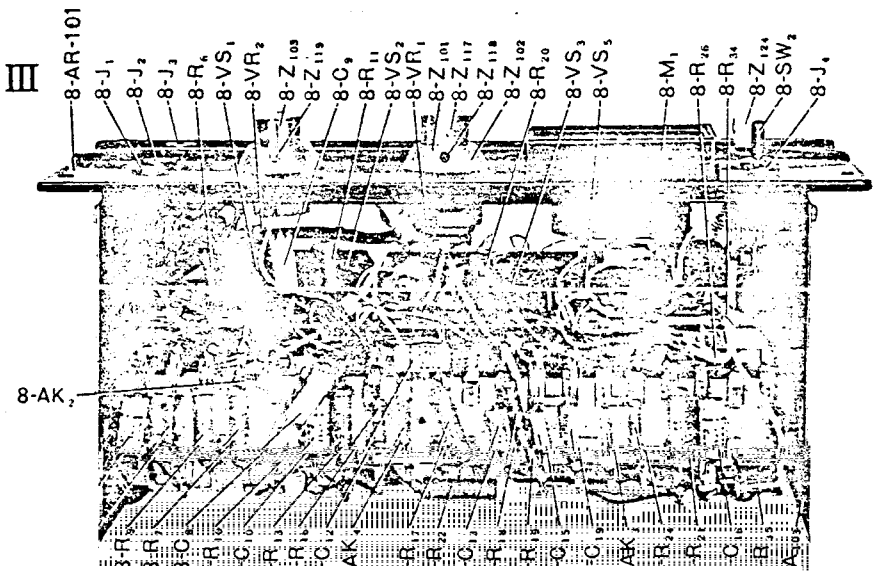
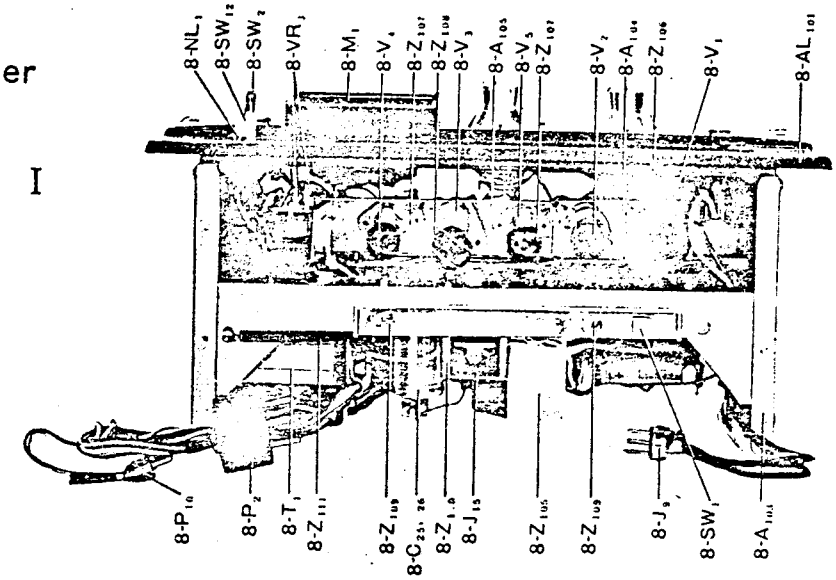


Left Amplifier

I



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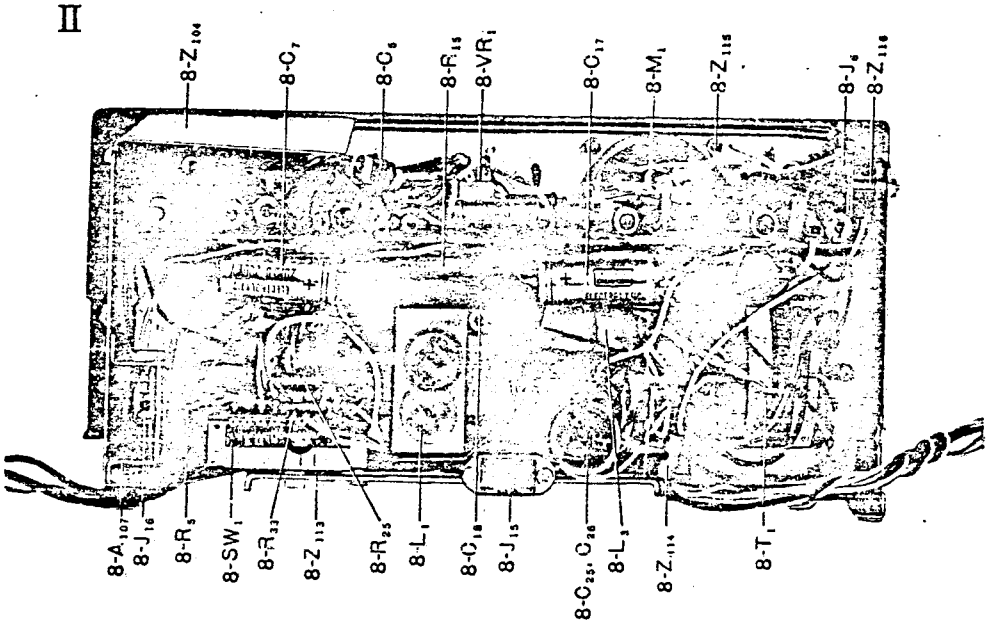

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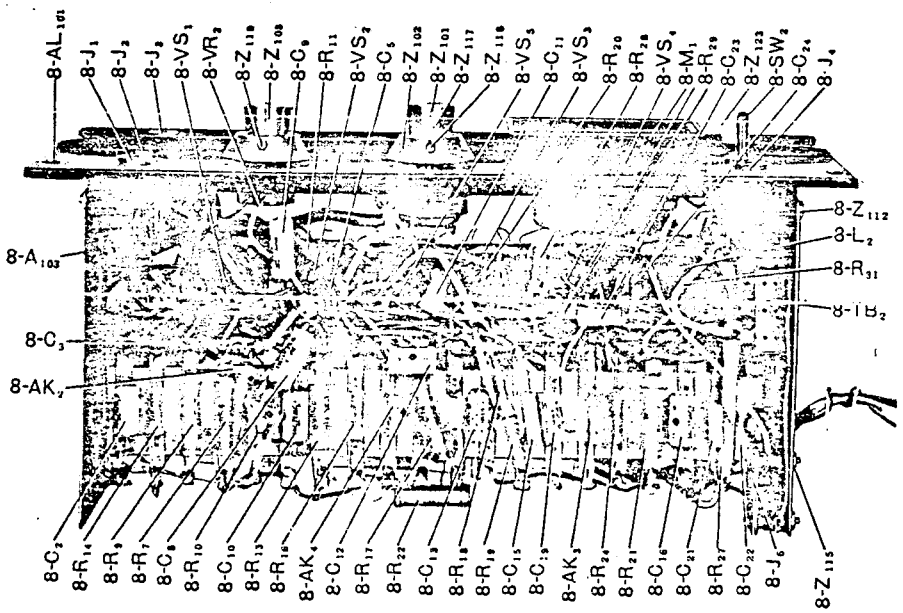
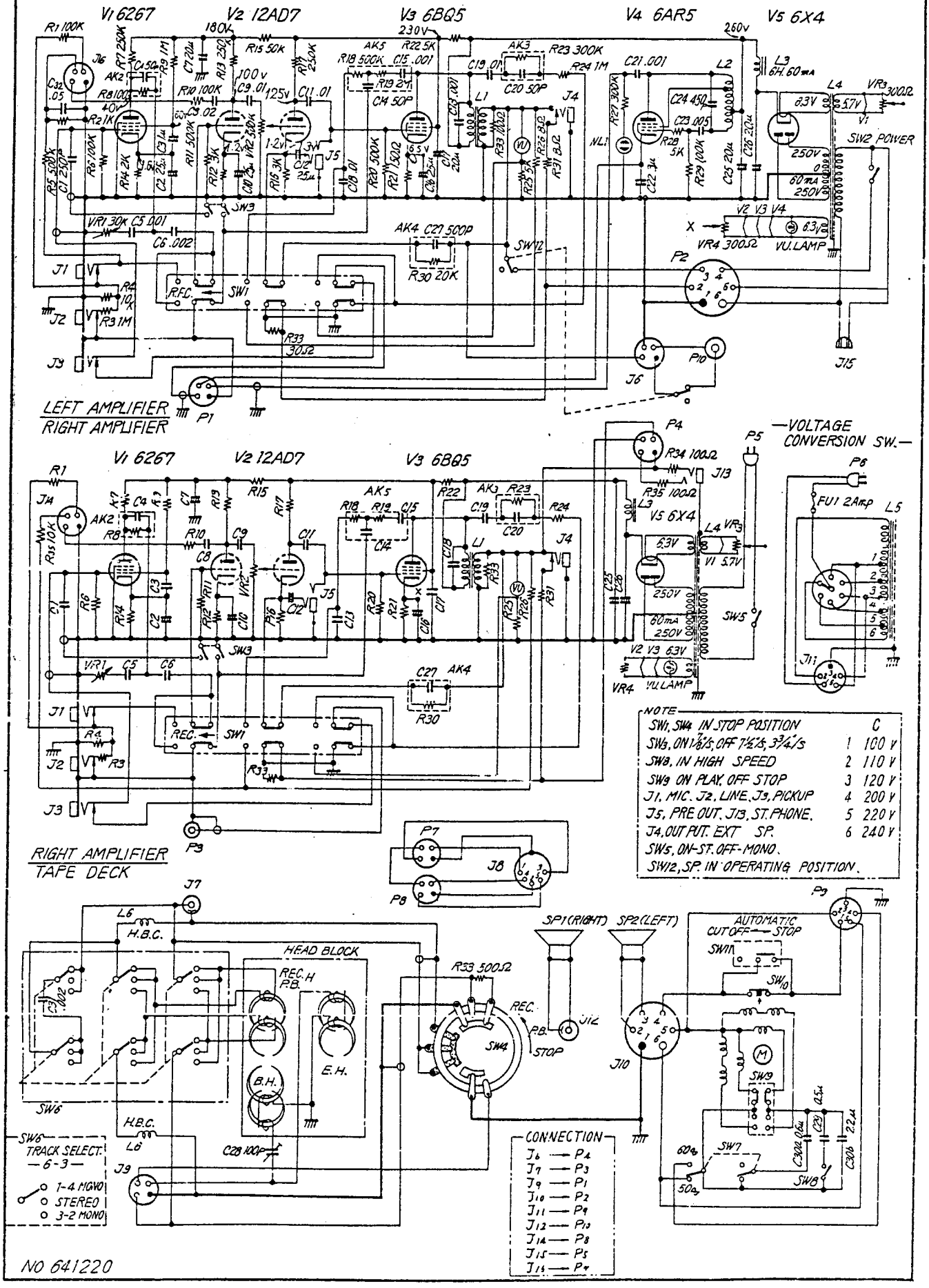


MODEL M-8 SCHEMATIC



NOTE

SW1, SW4 IN STOP POSITION	C
SW2, ON 1⅞"/S, OFF 7½"/S, 3¾"/S	1 100 V
SW8, IN HIGH SPEED	2 110 V
SW9 ON PLAY, OFF STOP	3 120 V
J1, MIC. J2, LINE, J3, PICKUP	4 200 V
J5, PRE OUT, J13, ST. PHONE.	5 220 V
J4, OUT PUT. EXT SP.	6 240 V
SW5, ON-ST. OFF-MONO.	
SW12, SP. IN OPERATING POSITION.	

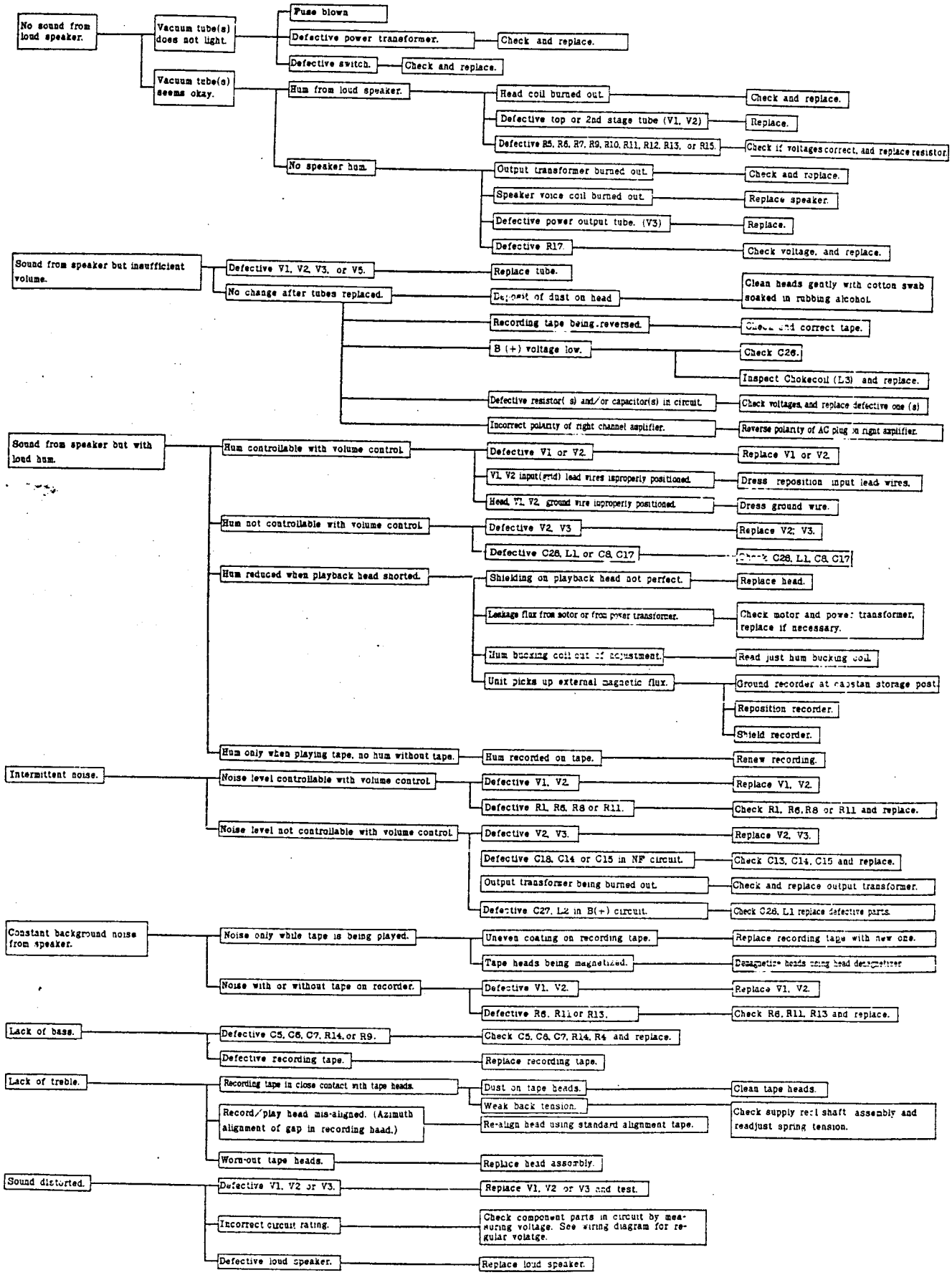
CONNECTION

J6 — P4	
J7 — P3	
J9 — P1	
J10 — P2	
J11 — P9	
J12 — P10	
J14 — P8	
J15 — P5	
J16 — P7	

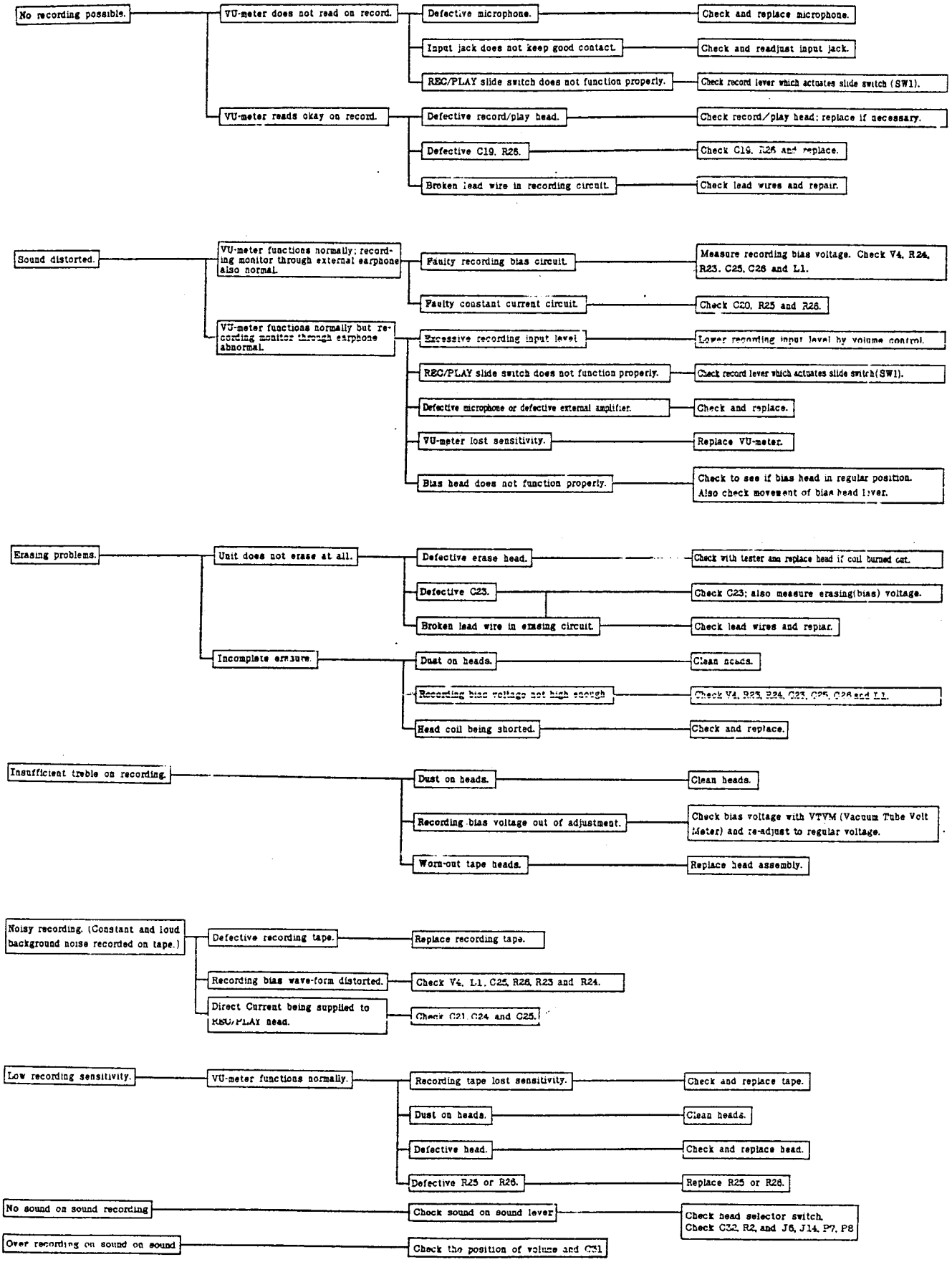
XII TROUBLE SHOOTING CHART FOR MODEL M-8

SECTION "A" TROUBLES WITH AMPLIFIER

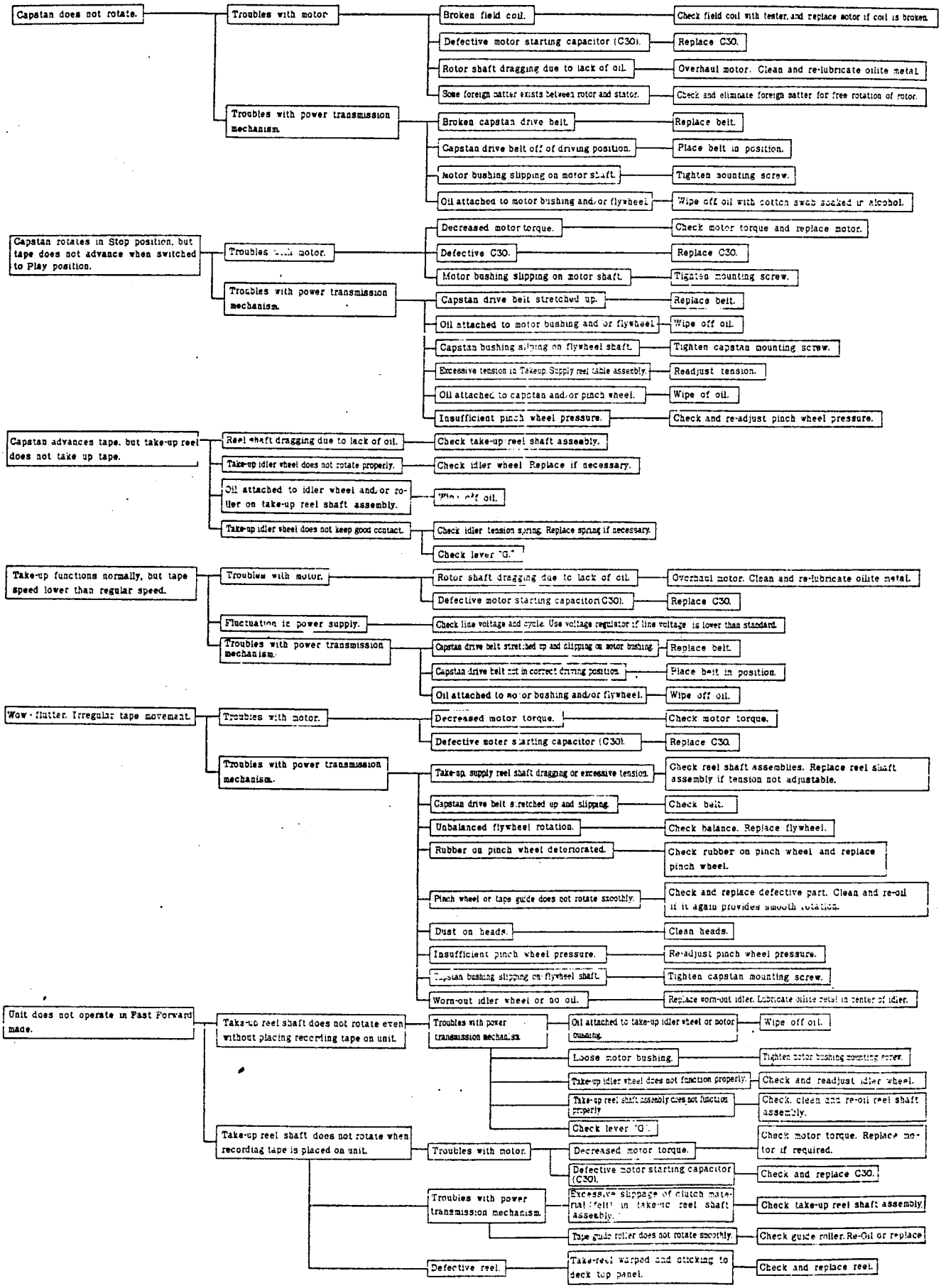
1. Playback problems. (Unit set in play position.)


No sound from loud speaker.
Vacuum tube(s) does not light.
Fuse blown
Defective power transformer.
Check and replace.
Defective switch.
Check and replace.
Vacuum tube(s) seems okay.
Hum from loud speaker.
Head coil burned out.
Check and replace.
Defective top or 2nd stage tube (V1, V2)
Replace.
Defective R5, R6, R7, R9, R10, R11, R12, R13, or R15.
Check if voltages correct, and replace resistor.
No speaker hum.
Output transformer burned out.
Check and replace.
Speaker voice coil burned out.
Replace speaker.
Defective power output tube. (V3)
Replace.
Defective R17.
Check voltage, and replace.
Sound from speaker but insufficient volume.
Defective V1, V2, V3, or V5.
Replace tube.
No change after tubes replaced.
Deposit of dust on head
Clean heads gently with cotton swab soaked in rubbing alcohol.
Recording tape being reversed.
Check and correct tape.
B (+) voltage low.
Check C26.
Inspect Chokecoil (L3) and replace.
Defective resistor(s) and/or capacitor(s) in circuit.
Check voltages, and replace defective one (s)
Incorrect polarity of right channel amplifier.
Reverse polarity of AC plug in right amplifier.
Sound from speaker but with loud hum.
Hum controllable with volume control.
Defective V1 or V2.
Replace V1 or V2.
V1, V2 input(grid) lead wires improperly positioned.
Dress reposition input lead wires.
Head, V1, V2 ground wire improperly positioned.
Dress ground wire.
Hum not controllable with volume control.
Defective V2, V3
Replace V2, V3.
Defective C26, L1, or C8, C17
Check C26, L1, C8, C17
Hum reduced when playback head shorted.
Shielding on playback head not perfect.
Replace head.
Leakage flux from motor or from power transformer.
Check motor and power transformer, replace if necessary.
Hum bucking coil out of adjustment.
Read just hum bucking coil.
Unit picks up external magnetic flux.
Ground recorder at capstan storage post.
Reposition recorder.
Shield recorder.
Hum only when playing tape, no hum without tape.
Hum recorded on tape.
Renew recording.
Intermittent noise.
Noise level controllable with volume control.
Defective V1, V2.
Replace V1, V2.
Defective R1, R6, R8 or R11.
Check R1, R6, R8 or R11 and replace.
Noise level not controllable with volume control.
Defective V2, V3.
Replace V2, V3.
Defective C18, C14 or C15 in NF circuit.
Check C13, C14, C15 and replace.
Output transformer being burned out.
Check and replace output transformer.
Defective C27, L2 in B(+) circuit.
Check C26, L1 replace defective parts.
Constant background noise from speaker.
Noise only while tape is being played.
Uneven coating on recording tape.
Replace recording tape with new one.
Tape heads being magnetized.
Demagnetize heads using head demagnetizer
Noise with or without tape on recorder.
Defective V1, V2.
Replace V1, V2.
Defective R6, R11 or R13.
Check R6, R11, R13 and replace.
Lack of bass.
Defective C5, C6, C7, R14, or R9.
Check C5, C6, C7, R14, R4 and replace.
Defective recording tape.
Replace recording tape.
Lack of treble.
Recording tape in close contact with tape heads.
Dust on tape heads.
Clean tape heads.
Weak back tension.
Check supply reel shaft assembly and readjust spring tension.
Record/play head mis-aligned. (Azimuth alignment of gap in recording head.)
Re-align head using standard alignment tape.
Worn-out tape heads.
Replace head assembly.
Sound distorted.
Defective V1, V2 or V3.
Replace V1, V2 or V3 and test.
Incorrect circuit rating.
Check component parts in circuit by measuring voltage. See wiring diagram for regular volatge.
Defective loud speaker.
Replace loud speaker.

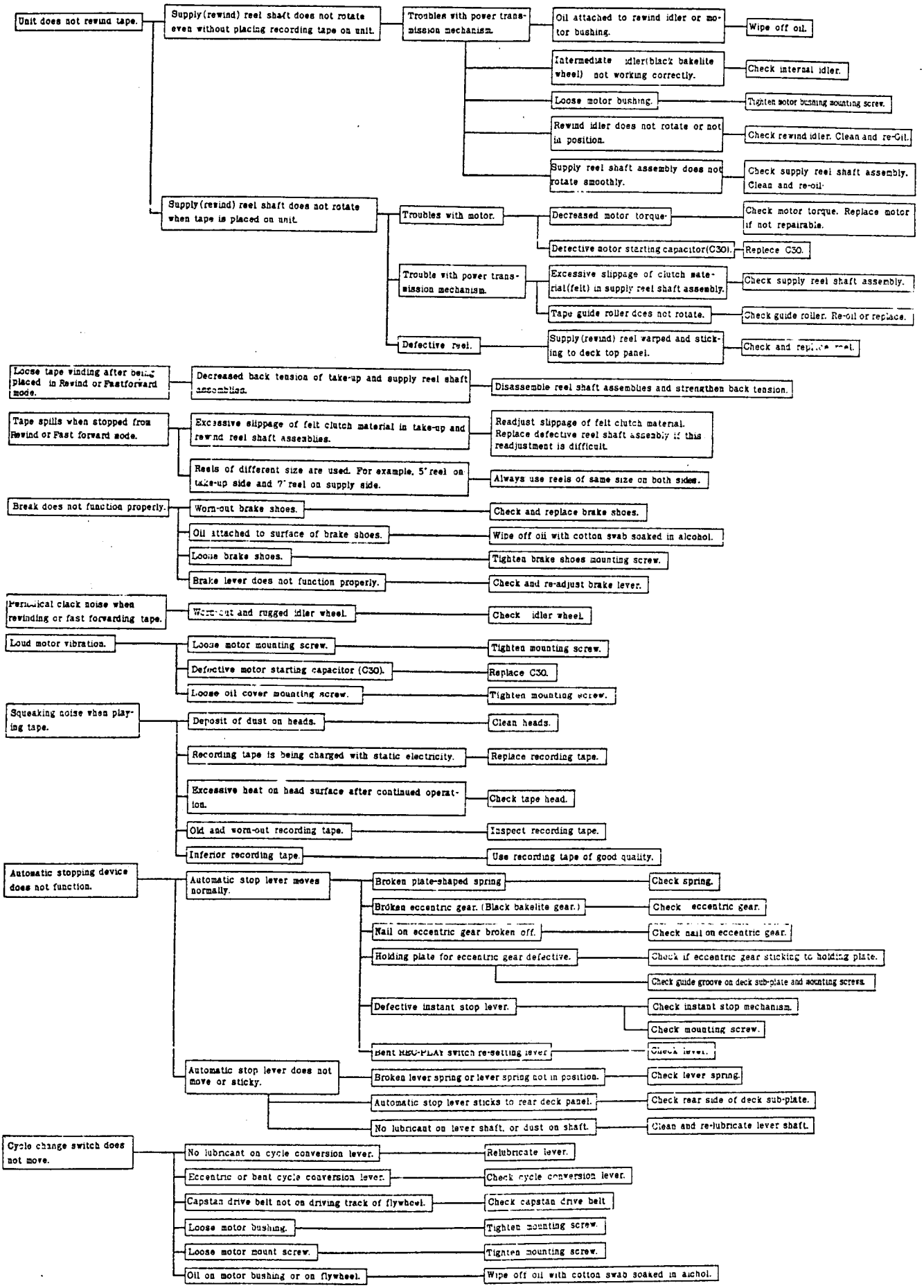
2. Recording Problems.
(Unit plays back pre-recorded tapes okay, but recording not satisfactory.)


No recording possible.
VU-meter does not read on record.
Defective microphone.
Check and replace microphone.
Input jack does not keep good contact.
Check and readjust input jack.
REC/PLAY slide switch does not function properly.
Check record lever which actuates slide switch (SW1).
VU-meter reads okay on record.
Defective record/play head.
Check record/play head; replace if necessary.
Defective C19, R26.
Check C19, R26 and replace.
Broken lead wire in recording circuit.
Check lead wires and repair.
Sound distorted.
VU-meter functions normally; recording monitor through external earphone also normal.
Faulty recording bias circuit.
Measure recording bias voltage. Check V4, R24, R23, C25, C26 and L1.
Faulty constant current circuit.
Check C20, R25 and R26.
VU-meter functions normally but recording monitor through earphone abnormal.
Excessive recording input level.
Lower recording input level by volume control.
REC/PLAY slide switch does not function properly.
Check record lever which actuates slide switch(SW1).
Defective microphone or defective external amplifier.
Check and replace.
VU-meter lost sensitivity.
Replace VU-meter.
Bias head does not function properly.
Check to see if bias head in regular position. Also check movement of bias head lever.
Erasing problems.
Unit does not erase at all.
Defective erase head.
Check with tester and replace head if coil burned out.
Defective C23.
Check C23; also measure erasing(bias) voltage.
Broken lead wire in erasing circuit.
Check lead wires and repair.
Incomplete erasure.
Dust on heads.
Clean heads.
Recording bias voltage not high enough
Check V4, R23, R24, C23, C25, C26 and L1.
Head coil being shorted.
Check and replace.
Insufficient treble on recording.
Dust on heads.
Clean heads.
Recording bias voltage out of adjustment.
Check bias voltage with VTVM (Vacuum Tube Volt Meter) and re-adjust to regular voltage.
Worn-out tape heads.
Replace head assembly.
Noisy recording. (Constant and loud background noise recorded on tape.)
Defective recording tape.
Replace recording tape.
Recording bias wave-form distorted.
Check V4, L1, C25, R26, R23 and R24.
Direct Current being supplied to REC/PLAY head.
Check C21, C24 and C25.
Low recording sensitivity.
VU-meter functions normally.
Recording tape lost sensitivity.
Check and replace tape.
Dust on heads.
Clean heads.
Defective head.
Check and replace head.
Defective R25 or R26.
Replace R25 or R26.
No sound on sound recording
Check sound on sound lever
Check head selector switch. Check C32, R2, and J6, J14, P7, P8
Over recording on sound on sound
Check the position of volume and C31

SECTION "B" TROUBLES WITH TAPE TRANSPORT MECHANISM.


Capstan does not rotate.
Troubles with motor
Broken field coil.
Check field coil with tester, and replace motor if coil is broken.
Defective motor starting capacitor (C30).
Replace C30.
Rotor shaft dragging due to lack of oil.
Overhaul motor. Clean and re-lubricate oilite metal.
Some foreign matter exists between rotor and stator.
Check and eliminate foreign matter for free rotation of rotor.
Troubles with power transmission mechanism.
Broken capstan drive belt.
Replace belt.
Capstan drive belt off of driving position.
Place belt in position.
Motor bushing slipping on motor shaft.
Tighten mounting screw.
Oil attached to motor bushing and/or flywheel.
Wipe off oil with cotton swab soaked in alcohol.
Capstan rotates in Stop position, but tape does not advance when switched to Play position.
Troubles with motor.
Decreased motor torque.
Check motor torque and replace motor.
Defective C30.
Replace C30.
Motor bushing slipping on motor shaft.
Tighten mounting screw.
Troubles with power transmission mechanism.
Capstan drive belt stretched up.
Replace belt.
Oil attached to motor bushing and/or flywheel.
Wipe off oil.
Capstan bushing slipping on flywheel shaft.
Tighten capstan mounting screw.
Excessive tension in Takeup Supply reel table assembly.
Readjust tension.
Oil attached to capstan and/or pinch wheel.
Wipe of oil.
Insufficient pinch wheel pressure.
Check and re-adjust pinch wheel pressure.
Capstan advances tape, but take-up reel does not take up tape.
Reel shaft dragging due to lack of oil.
Check take-up reel shaft assembly.
Take-up idler wheel does not rotate properly.
Check idler wheel. Replace if necessary.
Oil attached to idler wheel and/or roller on take-up reel shaft assembly.
Wipe off oil.
Take-up idler wheel does not keep good contact.
Check idler tension spring. Replace spring if necessary.
Check lever "G."
Take-up functions normally, but tape speed lower than regular speed.
Troubles with motor.
Rotor shaft dragging due to lack of oil.
Overhaul motor. Clean and re-lubricate oilite metal.
Defective motor starting capacitor(C30).
Replace C30.
Fluctuation in power supply.
Check line voltage and cycle. Use voltage regulator if line voltage is lower than standard.
Troubles with power transmission mechanism.
Capstan drive belt stretched up and slipping on motor bushing.
Replace belt.
Capstan drive belt not in correct driving position.
Place belt in position.
Oil attached to motor bushing and/or flywheel.
Wipe off oil.
Wow - flutter. Irregular tape movement.
Troubles with motor.
Decreased motor torque.
Check motor torque.
Defective motor starting capacitor (C30).
Replace C30.
Troubles with power transmission mechanism.
Take-up supply reel shaft dragging or excessive tension.
Check reel shaft assemblies. Replace reel shaft assembly if tension not adjustable.
Capstan drive belt stretched up and slipping.
Check belt.
Unbalanced flywheel rotation.
Check balance. Replace flywheel.
Rubber on pinch wheel deteriorated.
Check rubber on pinch wheel and replace pinch wheel.
Pinch wheel or tape guide does not rotate smoothly.
Check and replace defective part. Clean and re-oil if it again provides smooth rotation.
Dust on heads.
Clean heads.
Insufficient pinch wheel pressure.
Re-adjust pinch wheel pressure.
Capstan bushing slipping on flywheel shaft.
Tighten capstan mounting screw.
Worn-out idler wheel or no oil.
Replace worn-out idler. Lubricate oilite metal in center of idler.
Unit does not operate in Fast Forward mode.
Take-up reel shaft does not rotate even without placing recording tape on unit.
Troubles with power transmission mechanism
Oil attached to take-up idler wheel or motor bushing.
Wipe off oil.
Loose motor bushing.
Tighten motor bushing mounting screw.
Take-up idler wheel does not function properly.
Check and readjust idler wheel.
Take-up reel shaft assembly does not function properly.
Check, clean and re-oil reel shaft assembly.
Check lever "G."
Take-up reel shaft does not rotate when recording tape is placed on unit.
Troubles with motor.
Decreased motor torque.
Check motor torque. Replace motor if required.
Defective motor starting capacitor (C30).
Check and replace C30.
Troubles with power transmission mechanism.
Excessive slippage of clutch material felt in take-up reel shaft assembly.
Check take-up reel shaft assembly.
Tape guide roller does not rotate smoothly.
Check guide roller. Re-Oil or replace.
Defective reel.
Take-reel warped and sticking to deck top panel.
Check and replace reel.

SECTION "B" TROUBLES WITH TAPE TRANSPORT MECHANISM.


Unit does not rewind tape.
Supply (rewind) reel shaft does not rotate even without placing recording tape on unit.
Troubles with power transmission mechanism.
Oil attached to rewind idler or motor bushing.
Wipe off oil.
Intermediate idler(black bakelite wheel) not working correctly.
Check internal idler.
Loose motor bushing.
Tighten motor bushing mounting screw.
Rewind idler does not rotate or not in position.
Check rewind idler. Clean and re-Oil.
Supply reel shaft assembly does not rotate smoothly.
Check supply reel shaft assembly. Clean and re-oil.
Supply (rewind) reel shaft does not rotate when tape is placed on unit.
Troubles with motor.
Decreased motor torque.
Check motor torque. Replace motor if not repairable.
Defective motor starting capacitor(C30).
Replace C30.
Trouble with power transmission mechanism.
Excessive slippage of clutch material(felt) in supply reel shaft assembly.
Check supply reel shaft assembly.
Tape guide roller does not rotate.
Check guide roller. Re-oil or replace.
Defective reel.
Supply (rewind) reel warped and sticking to deck top panel.
Check and replace reel.
Loose tape winding after being placed in Rewind or Fastforward mode.
Decreased back tension of take-up and supply reel shaft assemblies.
Disassemble reel shaft assemblies and strengthen back tension.
Tape spills when stopped from Rewind or Fast forward mode.
Excessive slippage of felt clutch material in take-up and rewind reel shaft assemblies.
Readjust slippage of felt clutch material. Replace defective reel shaft assembly if this readjustment is difficult.
Reels of different size are used. For example, 5" reel on take-up side and 7" reel on supply side.
Always use reels of same size on both sides.
Break does not function properly.
Worn-out brake shoes.
Check and replace brake shoes.
Oil attached to surface of brake shoes.
Wipe off oil with cotton swab soaked in alcohol.
Loose brake shoes.
Tighten brake shoes mounting screw.
Brake lever does not function properly.
Check and re-adjust brake lever.
Periodical clack noise when rewinding or fast forwarding tape.
Worn-out and rugged idler wheel.
Check idler wheel.
Loud motor vibration.
Loose motor mounting screw.
Tighten mounting screw.
Defective motor starting capacitor (C30).
Replace C30.
Loose oil cover mounting screw.
Tighten mounting screw.
Squeaking noise when playing tape.
Deposit of dust on heads.
Clean heads.
Recording tape is being charged with static electricity.
Replace recording tape.
Excessive heat on head surface after continued operation.
Check tape head.
Old and worn-out recording tape.
Inspect recording tape.
Inferior recording tape.
Use recording tape of good quality.
Automatic stopping device does not function.
Automatic stop lever moves normally.
Broken plate-shaped spring
Check spring.
Broken eccentric gear. (Black bakelite gear.)
Check eccentric gear.
Nail on eccentric gear broken off.
Check nail on eccentric gear.
Holding plate for eccentric gear defective.
Check if eccentric gear sticking to holding plate.
Check guide groove on deck sub-plate and mounting screws.
Defective instant stop lever.
Check instant stop mechanism.
Check mounting screw.
Bent REC-PLAY switch re-setting lever
Check lever.
Automatic stop lever does not move or sticky.
Broken lever spring or lever spring not in position.
Check lever spring.
Automatic stop lever sticks to rear deck panel.
Check rear side of deck sub-plate.
No lubricant on lever shaft, or dust on shaft.
Clean and re-lubricate lever shaft.
Cycle change switch does not move.
No lubricant on cycle conversion lever.
Relubricate lever.
Eccentric or bent cycle conversion lever.
Check cycle conversion lever.
Capstan drive belt not on driving track of flywheel.
Check capstan drive belt
Loose motor bushing.
Tighten mounting screw.
Loose motor mount screw.
Tighten mounting screw.
Oil on motor bushing or on flywheel.
Wipe off oil with cotton swab soaked in alchol.

XIII MODEL M-8 CONNECTING DIAGRAM